JOURNAL
OF THE
AMERICAN VETERINARY MEDICAL ASSOCIATION

GENERAL ARTICLES

Susceptibility of Bluetongue Virus to Magnamycin—*D. A. Price* 199

SURGERY AND OBSTETRICS

A New Method of Treatment of Oblique Supracondylar Fractures of the Femur with Collision Cruciate Screws—*Morton Wolf* 204
Use of Equine Gonadotropin in Bovine Functional Infertility—*H. J. Hill* 208
Congenital Cecocolic Stenosis—*Charles S. Crane* 210

CLINICAL DATA

A Bacteriological Study of Ten Persistent Reactor Cows Following Vaccination with Brucella Abortus, Strain 19—*Morse—Robertstad—Beach—Ristic* 212
Salmonellosis in Turkey Poults as Observed in Routine Necropsy of 1,148 Cases—*G. N. Lukas and Donald R. Bradford* 215
A Liver Degeneration of Unknown Origin in Chickens—*David C. Tudor* 219
Use of Dibenzylethylenediamine Dipenicillin G and Dihydrostreptomycin Sulfate in Chronic Respiratory Disease of Chickens—*S. C. Schmittle* 221
Rabies in a Native Carabao—*José B. Aranez* 223
Clinical Report of a Brain Abscess in a Gilt—*D. L. Thomas* 224
Atrophic Rhinitis. IV. Nasal Examination for Pasturella Multocida in Two Swine Herds Affected with Atrophic Rhinitis—*Heddleston—Shuman—Earl* 225
New Treatment for Bovine Rectal, Vaginal, and Uterine Prolapses—*R. O. Rydell* 226
Magnamycin in Small Animal Practice—*J. Antelyes* 228
Parturient Paresis Problem Cases—*R. O. Rydell* 230
Bacterial Flora of the Canine Vaginal Secretion—*A. A. Leibold* 231
Some Relationships of the Gram Reaction to Bacterial Disease Processes—*John W. Osebold* 234
Vaccination of Sheep with Clostridium Perfringens Type D Vaccine—*Percival—Burkhart—Cooper—Martini* 236
Feline Diseases—*Wayne H. Riser* 238
Prolapse of the Rectum of a Horse—*G. S. McKee* 243
Experimental Production of Bovine Hyperkeratosis with a Feed Concentrate Exposed to Vapors of a Highly Chlorinated Naphthalene—*Gregory—Wise—Sikes* 244
Laboratory Diagnosis of Rabies—*C. H. Kitselman* 246

EDITORIAL

The Art of Physical Diagnosis, Emphasizing Palpation 249

(*Contents continued on adv. pages 2 and 4*)

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CONTENTS

(*Continued from Cover*)

SURGERY AND OBSTETRICS

Aseptic Wound Fever 207
Embryonic Mortality Associated with Bulls of Low and High Fertility 207
Storage Temperature of Sperm in Birds .. 207
Factors Affecting Heifer Puberty 207
Prevention of Human Abortion 207
Electroejaculation of the Bull 209
Foot-and-Mouth Disease and Fertility 209
A Surgical Tip—A Sterile Teat Knife ... 209
Rate of Embryonic Deaths in Ewes 209
Results of Bovine Embryotomy 209
Spraying in Castrated Cats 209
Controlling Vibrio Fetus in Semen 209
Electrical Ejaculation of the Bull 209
Hormones and Retained Placentas 210
Fertility Duration in Turkeys 210
The Liger, a Rare Feline Hybrid 210

CLINICAL DATA

Induced Histoplasmosis in Dogs 214
Dieldrin for Maggot Control in Sheep 218
Research on Air Sac Infection 220
Effect of Caponizing on Newcastle Disease Immunity 220
Rabies Vaccination Paralysis 224
More on Chlorophyll Deodorizing 227
An Erysipelas Bacterin 230
Swine Practice Pointers 230
Tenth Anniversary for Streptomycin 230
Drams Not Ounces in Swine Dysentery .. 233
Salivation and Frothy Bloat 237
Potassium Penicillin—Not Procaine 237
Weeping Eczema in Young Pigs 237
Oxytocin-Induced Udder Evacuation 246

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$10.00 per annum Foreign $10.50; Canada $10.50 Single Copies $1.00 Prepaid in U.S.

Published monthly at 600 S. Michigan Ave., Chicago, Ill., by the American Veterinary Medical Association. Entered as second class matter August 10, 1932, at the Post Office at Chicago 5, Illinois, under the act of March 3, 1879. Additional entry at Mendota, Ill. Accepted for mailing at special rate of postage provided for in Section 538, act of February 28, 1925, authorized August 10, 1932. Reproduction of any part of this publication is prohibited, unless special permission is given. Permission will be given if the purpose seems justifiable and, in signed articles, if the rights or requests of author are not violated thereby. Reprints should be ordered in advance. Prices will be quoted after publication. Please send prompt notice of change of address, giving both old and new. Advise whether the change is temporary or permanent. Address all correspondence to American Veterinary Medical Association, 600 S. Michigan Ave., Chicago 5, Ill.

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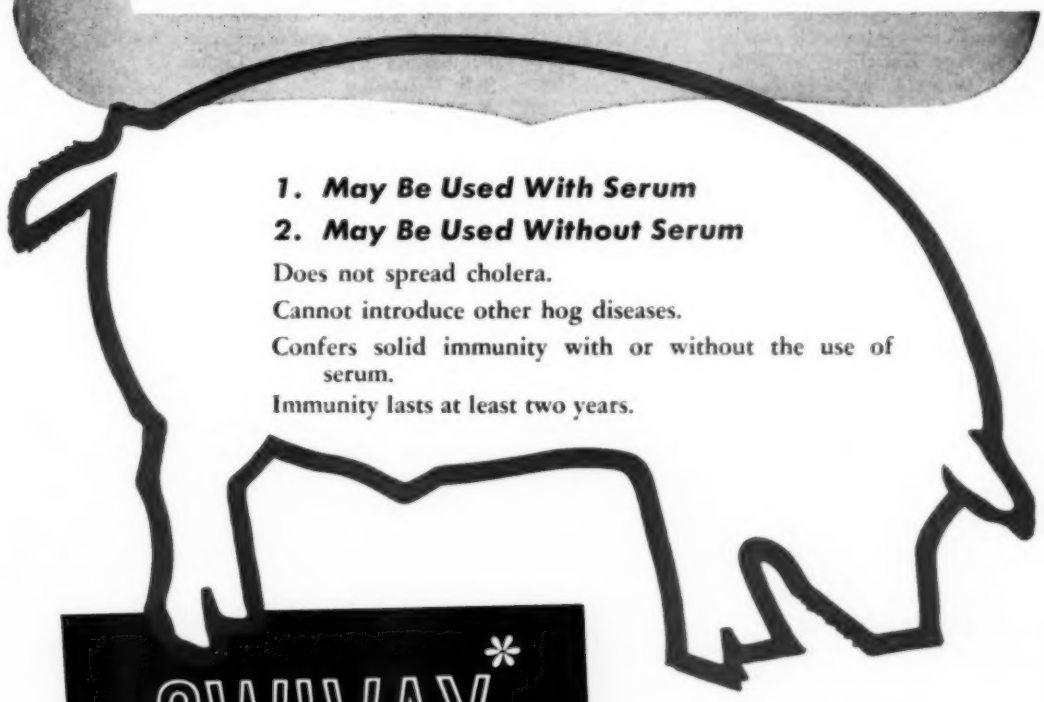

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CONTENTS—Continued

NUTRITION

Pig Anemia Due to Copper Deficiency ... 247
Molasses Feeding Increases 247
Iron Therapy for Calf Anemia 247
The Iron Deficiency of Milk 247
Cob Powder in Cattle Feed 247
More Fats Used in Feeds 247
Ammoniated Molasses Jag 248
Tolerance of Sheep to Sodium Chloride .. 248
Chronic Sodium Chloride Toxicity 248
Alfalfa Saponin and Ruminant Bloat 248
Preventing Bloat from Ladino 248
Salt Poisoning 248
A Liver Extract for Scouring Pigs 248

EDITORIAL

Viability of Strangulated Bowel 250
Dr. William Moore—1884-1954 250

CURRENT LITERATURE

Abstracts

The Sheep Mite, Psorergates Ovis, 251; Studies on Neoascaris Vitulorum, 251; Parasitism in Sheep on Rangeland, 251; Teeth of the Ox in Clinical Diagnosis, 251; Brucella Immunity, 251; Serodiagnosis of Bovine Leptospirosis, 252; Electrophoretic Study of the Horse Serum of Equine Infectious Anemia, 252; Metapon Analgesia in the Dog, 253; Enterotoxemia Immunity in Lambs, 253; Tocopherol Deficiency in Young Calves, 253; Studies of Ketosis in Dairy Cows, 253; Electrocardiograms of the Dog, 253; Life History of Cooperia Punctata, 253; Transmission of Ovine Vibriosis, 254; Foot-and-Mouth Disease Research, 254; Response of Various Animals to Vesicular Stomatitis, 254; Effects of Dietary Deficiencies on Electrocardiograms of Chickens, 254.

Foreign Abstracts

Nitrofurazone for Eimeria Infection, 254; Acute Pancreas Necrosis in Swine, 254; Strychnine Poisoning in the Dog, 254; Testosterone to Prevent Cortisone-Induced Adrenocortical Atrophy, 255; Colchicine in the Treatment of Warts, 255; Genital Tuberculosis in the Cat, 255.

Books and Reports

The Anatomy of the Domestic Animals, 255.

THE NEWS

Drs. R. S. Sugg and F. J. Kingma Elected in Executive Board Districts IV and X 256
Foreign Veterinary Colleges Evaluated by the AVMA Council on Education 256
News from Washington 257
Women's Auxiliary 258
Applications 258
Commencements 264
U. S. Government 264
Among the States and Provinces 265
Foreign News 270
State Board Examinations 271
Veterinary Military Service 271
Marriages 272
Births 272
Deaths 272

MISCELLANEOUS

Another Veterinarian with Strain 19 Brucellosis, 202; Chinchilla Industry Has Pelt Sale, 202; The Epizootic Score Card, 202; The Humps of African Cattle, 202; A Plastic Dressing for Burns, 203; Histoplasmosis in Man Not Rare, 203; Cleft Lips and Cleft Palates, 203; Bovine Photosensitization, 203.

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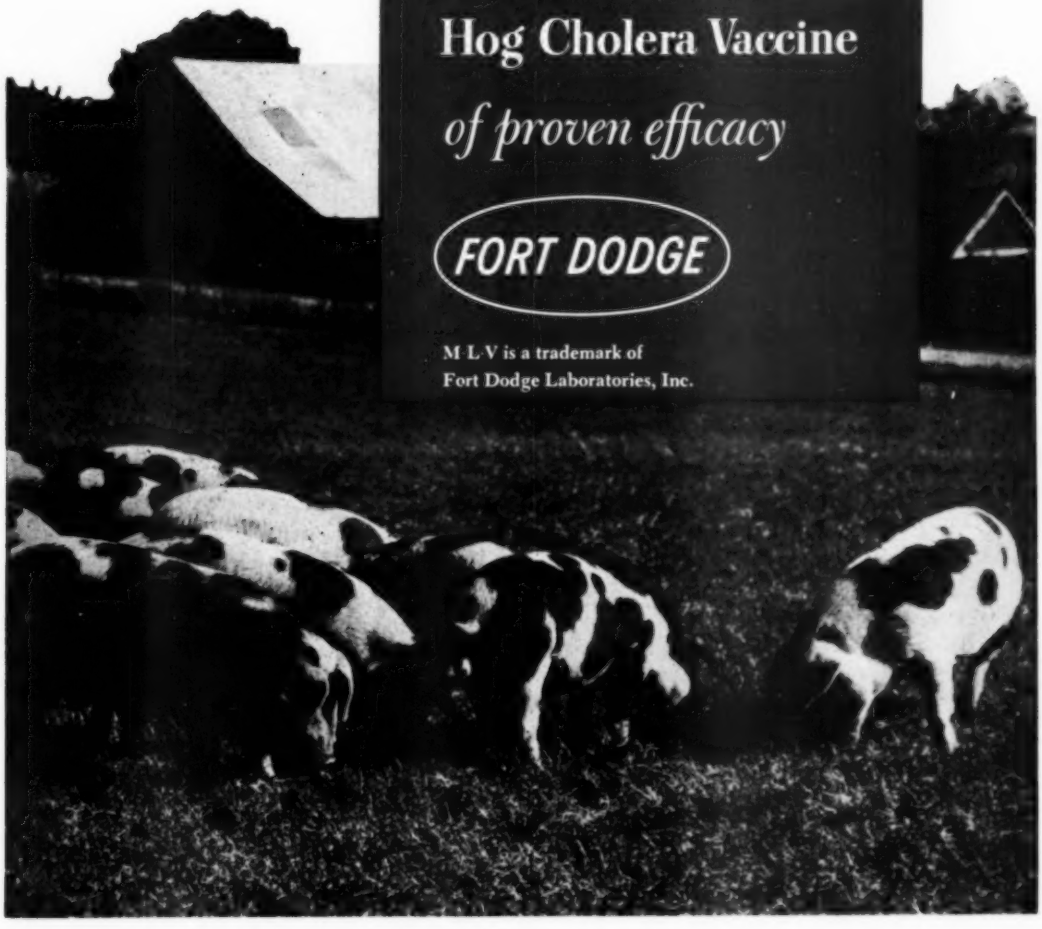


AVMA ☆ Report

Veterinary Medical Activities

✦ Officers, Executive Board members, and several Central Office staff members spent part or all of the week preceding the 1954 annual meeting in Seattle engaged in preconvention sessions and in final preparations for the meeting.

★ ★ ★

✦ On July 28 and 29, Drs. Hardenbergh and Kingman met with the Committee on Local arrangements for the 1955 meeting to be held in Minneapolis, Minn. The increasing size in AVMA meetings now makes it necessary for the planning to start a year in advance of the actual meeting date. Since the Local Committee on Arrangements for the Minneapolis meeting has already been selected, and specific assignments made, these chairmen and chairwomen, while attending the Seattle meeting, will have an opportunity to observe those functions which will be their responsibility next year.

★ ★ ★

✦ The Special Committee on Insurance recently appointed by the Board of Governors (O. Norling-Christensen, chairman; Carl Brandly, and H .D. Carter) met in the AVMA offices on July 30 to study the needs for group disability and accident insurance, and to make recommendations to the Executive Board regarding the desirability of the AVMA undertaking a national plan.

★ ★ ★

✦ Twenty officers of the Army and Air Force Veterinary Corps, attending the Dairy and Meat Hygiene School at the Quartermaster Depot, Chicago, visited Association headquarters on Aug. 11, 1954. Members of the AVMA staff spoke to the group on the organization and activities of the Association and on other professional matters.

★ ★ ★

✦ Dr. Robert Getty, chairman of the AVMA Special Committee on Motion Pictures and TV, with Assistant Executive Secretary Kingman, attended the second Annual Audio-Visual Conference of Medical and Allied Sciences, held at the Conrad Hilton Hotel, Chicago, Aug. 2 and 3, 1954.

★ ★ ★

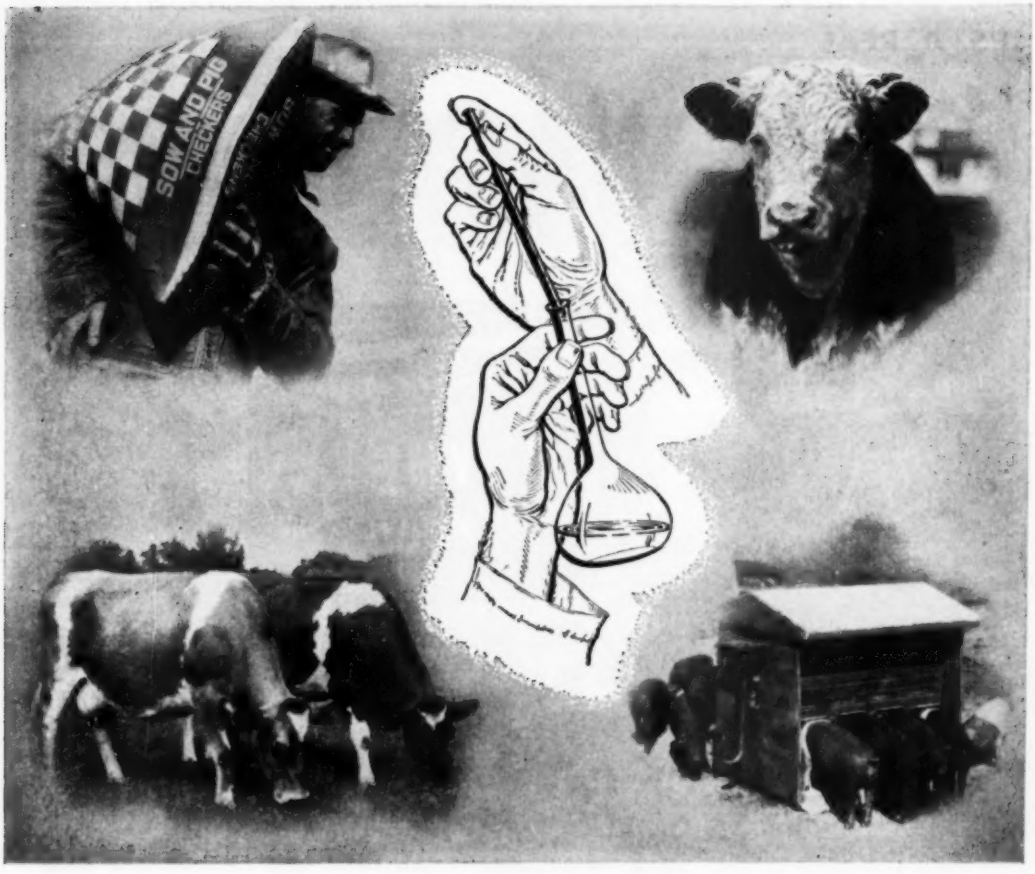
✦ The Agricultural Marketing Service, Poultry Branch, has requested Dr. J. C. Cunkelman to serve as AVMA representative on an advisory group pertaining to poultry processing, sanitation, and inspection. The first meeting of this advisory group is scheduled for Washington, D.C., Sept. 21 and 22, 1954.

★ ★ ★

✦ Dr. E. L. Stubbs, professor of veterinary pathology at the School of Veterinary Medicine, University of Pennsylvania, represented the Association at the Tenth World's Poultry Congress held in Edinburgh, Scotland, Aug. 13-21, 1954. Dr. Stubbs was on the program of the Congress and the Board of Governors designated him as official AVMA representative.

★ ★ ★

✦ Lt. Col. Rolland O. Scott, V.C., U.S.A.F., staff veterinarian, Headquarters, Third Air Force, now stationed in England, was designated by the Board of Governors to represent the Association at the Annual Congress of the British Veterinary Association, held at Torquay, Devon, Sept. 19-25, 1954. He participated in the discussion of the subject, "Meat Inspection Abroad."



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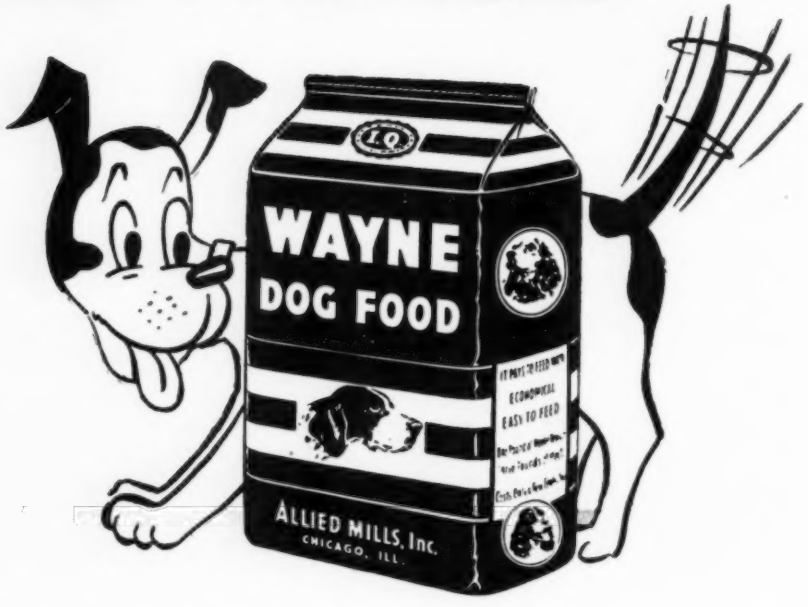

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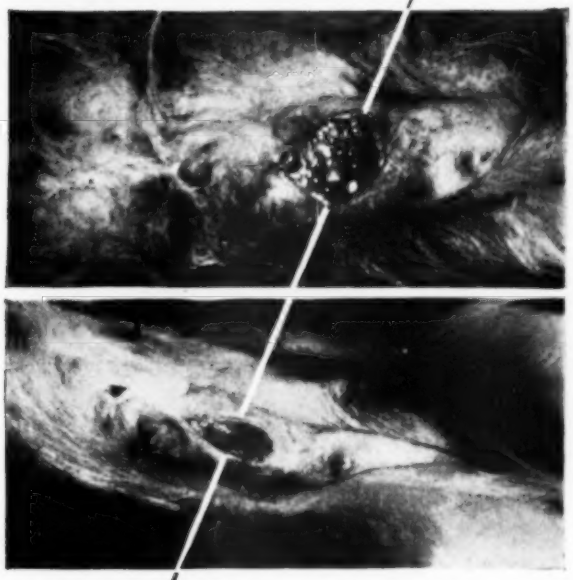

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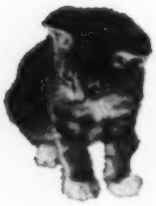

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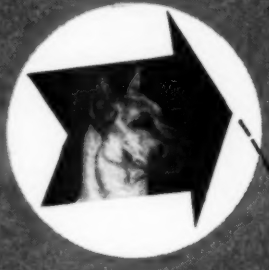

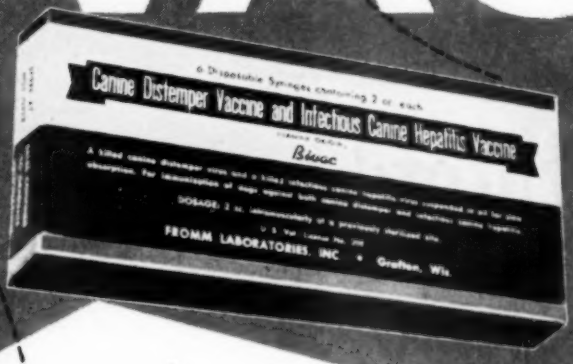

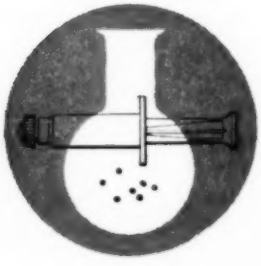

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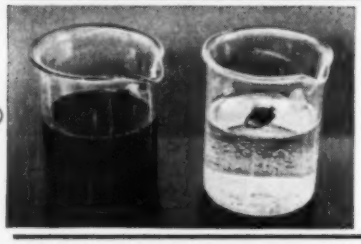

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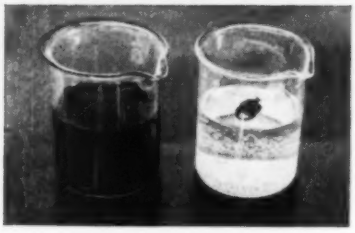

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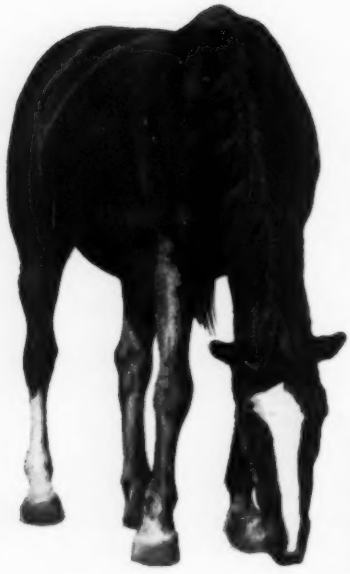

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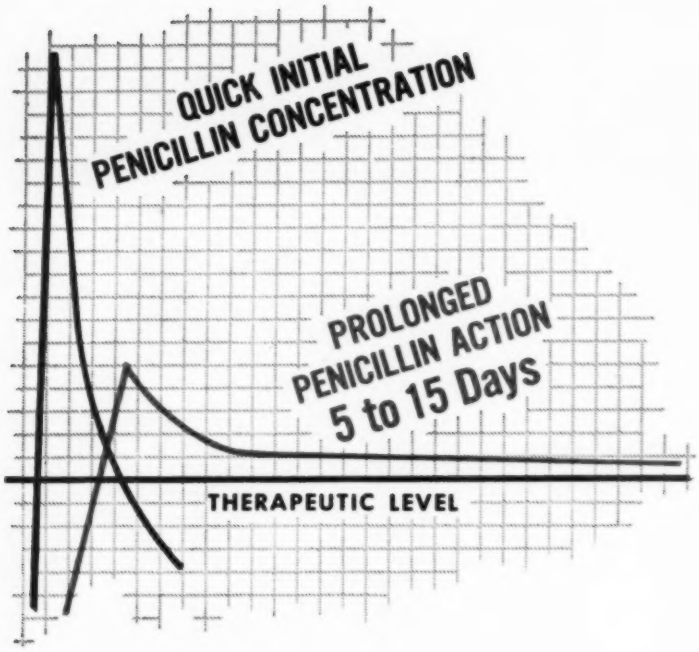

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Journal
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VOL. 125 SEPTEMBER, 1954 No. 930

Susceptibility of Bluetongue Virus to Magnamycin

D. A. PRICE, D.V.M.

Sonora, Texas

So MUCH attention has been given to the development and testing of bluetongue vaccines that therapy has been accorded secondary attention. It has been known for some time that sunlight exerts an intensifying effect on the course of bluetongue,[1] and it naturally follows that stabling of affected sheep will have a beneficial effect. The writer has observed clinically that the twice-daily administration of ephedrine hydrochloride gave considerable relief from the pulmonary hyperemia and edema in experimentally infected sheep. At necropsy, it was noted that sheep so treated had relatively patent bronchioles and much more functional lung tissue than untreated sheep which usually had mucus-filled bronchioles and areas of atelectasis in the lower portions of the lungs. Ephedrine therapy, however, has not been entirely satisfactory, for some mortalities occur in spite of it and appear to be the result of hydropericardium. Better chemotherapy probably will be found in a combination of drugs.

It is not surprising, in view of the particle size, that antibiotics have not yet proved efficacious in the treatment of bluetongue under controlled conditions. Bergey's[2] Manual of Determinative Bacteriology reports the infective particle size to be 87 to 105 $m\mu$ in diameter by sedimentation studies, and 100 to 132 $m\mu$ by ultracentrifugation. Penicillin, streptomycin, and aureomycin have all been used to protect bluetongue virus dilutions from bacterial contamination and are believed to have no deleterious effect on the virus.

When magnamycin (Pfizer brand of carbomycin) was offered for investigation of its possible use in bluetongue therapy, it was first used in a controlled preliminary experiment involving 6 sheep infected with the Sonora strain of bluetongue virus. When magnamycin sulfate was given intramuscularly to these sheep at the rate of 4 mg. per pound of body weight daily for four days, there were no indications of advantage for this therapy. Then, magnamycin was added to the standard inoculum used in the routine propagation of bluetongue virus in eggs. When it was found that the inoculum so treated produced a lower mortality than the standard inoculum (table 1), additional experiments were designed for further investigation.

The most significant outcome of this investigation was the establishment of the fact that magnamycin, under the conditions to be described, exerts activity against bluetongue virus and that this activity is enhanced by the presence of streptomycin, penicillin, or both.

TABLE 1—Presumptive Susceptibility of Bluetongue Virus to Magnamycin

Inoculum (0.2 ml./egg)	No. eggs	Survivors (days postinoculation) 1	2	3	4	5	6	7
Virus Streptomycin Penicillin	10	10	10	4	1	1	1	0
Virus Streptomycin Penicillin Magnamycin (12.5 mg./ml.)	5	5	5	5	5	5	5	5

From the Texas Agricultural Experiment Station, Substation No. 14, Sonora.

Magnamycin as the sulfate was supplied by Chas. Pfizer & Co., Inc., Brooklyn, N. Y.

Streptomycin and penicillin used in this study were supplied by Merck & Co., Rahway, N. J.

From the standpoint of applied research, the next important step should be an investigation to evaluate, in a scientific manner, the efficacy of these antibiotic combinations in the treatment of clinical bluetongue.

TABLE 2—Susceptibility of Bluetongue Virus to Antibiotic Combinations But Not to Magnamycin Alone

Inoculum (0.2 ml./egg)	No. eggs	Survivors (days postinoculation) 1	2	3	4	5	6	7
Virus Streptomycin Penicillin	6	6	6	0	0	0	0	0
Virus Streptomycin Penicillin Magnamycin (12.5 mg./ml.)	6	6	6	6	6	6	6	6
Virus Streptomycin Magnamycin (12.5 mg./ml.)	6	6	6	6	5	5	5	5
Virus Penicillin Magnamycin (12.5 mg./ml.)	6	6	6	6	6	6	6	6
Virus Magnamycin (12.5 mg./ml.)	6	6	6	0	0	0	0	0
Broth without virus Magnamycin (12.5 mg./ml.)	6	6	6	6	6	6	6	6

TABLE 3—Susceptibility of Bluetongue Virus to Streptomycin, Penicillin, and Magnamycin Combined

Inoculum (0.2 ml./egg)	No. eggs	Survivors (days postinoculation) 1	2	3	4	5	6	7
Virus Streptomycin Penicillin Magnamycin (12.5 mg./ml.)	5	5	5	5	5	5	5	5
Virus Streptomycin Penicillin Magnamycin (7.5 mg./ml.)	5	5	5	1	0	0	0	0
Virus Streptomycin Penicillin Magnamycin (2.5 mg./ml.)	5	5	5	0	0	0	0	0
Virus Streptomycin Penicillin Magnamycin (1.25 mg./ml.)	5	5	5	1	0	0	0	0

TABLE 4—Susceptibility of Bluetongue Virus to Streptomycin and Magnamycin Combined

Inoculum (0.2 ml./egg)	No. eggs	Survivors (days postinoculation) 1	2	3	4	5	6	7
Virus Streptomycin Magnamycin (12.5 mg./ml.)	5	5	5	5	5	5	5	4
Virus Streptomycin Magnamycin (7.5 mg./ml.)	5	5	5	5	1	0	0	0
Virus Streptomycin Magnamycin (2.5 mg./ml.)	5	5	5	1	1	1	1	1
Virus Streptomycin Magnamycin (1.25 mg./ml.)	5	5	5	4	1	0	0	0

MATERIALS AND METHODS

The bluetongue virus used in this study was the Sonora strain. Its origin and the preparation of inoculum for eggs have been described in an earlier paper.[2] Egg passage levels 46, 47, and 48, respectively, were used for the three experiments described. Antibiotics were added to the inoculums at the time the latter were prepared from dead embryos. The treated inoculums were stored unfrozen in a household refrigerator for one to four days before being used. Wherever mentioned in this report, streptomycin (calcium chloride complex) was used at the rate of 12.5 mg. per milliliter; penicillin G sodium, at the rate of 10,000 units per milliliter.

Eggs were given a preliminary incubation at 37.0 to 37.5 C. for seven days. After the injection of 0.2 ml. of inoculum into the yolk sac, they were further incubated at 33.6 C. Eggs were candled twice daily, embryo deaths after the first day being considered evidence of virus activity. Typically, the majority of deaths occur on the third or fourth day following inoculation with this strain in a 10^{-3} broth dilution.

RESULTS

Results of the first experiment suggested the susceptibility of bluetongue virus to magnamycin (table 1). While none of ten eggs inoculated with virus-streptomycin-penicillin mixture contained surviving embryos on the fourth day after inoculation, three of five eggs similarly treated, except for the addition of magnamycin, contained live embryos when discarded on the thirteenth day.

A second experiment was designed to provide for replication of the previous one and to demonstrate the effect of magnamycin alone, magnamycin plus virus, and magnamycin and virus plus each of the other antibiotics separately and combined. Results of this experiment (table 2) indicated that magnamycin alone, at the rate of 12.5 mg. per milliliter, was ineffective against the virus. However, with the same level of magnamycin, inactivation of the virus did occur as a result of an apparent synergism between magnamycin and streptomycin and also between magnamycin and penicillin.

The third experiment (tables 3 to 7) was intended to provide information relative to the minimal effective levels of the antibiotic combinations and the tolerance of chicken embryos to higher levels of magnamycin. The most significant result is shown in

table 6. It was shown that although magnamycin alone at the rate of 12.5 mg. per milliliter was ineffective against the virus, levels of 17.5 mg. and higher were effective.

As shown in tables 3, 4, and 5, magnamycin was effective at the lower rate of 12.5 mg. if penicillin or streptomycin or both were also present.

The data shown in tables 6 and 7 indicate that chicken embryos survived treatment with magnamycin in doses as high as 10 mg. per embryo.

DISCUSSION

This study clearly points to the need for an extensive treatment trial in which bluetongue-infected sheep can be treated with magnamycin and combinations of antibiotics under controlled conditions. Recently, a combination of magnamycin and penicillin appeared to be efficacious in the treatment of clinical bluetongue but infected controls were not available at the time. It is hoped that this paper will result in further studies *in vivo*.

Admittedly, the study was limited in nature and it would, therefore, be unwise to draw detailed conclusions without the support of replications. For instance, there is evidence that combinations of the three antibiotics are more effective against bluetongue virus *in ova* than magnamycin alone, but it is not clear which combination is the most efficacious.

For reasons of simplicity and convenience, the levels of penicillin and streptomycin were held constant in this study. However, future experiments in which the level of magnamycin is maintained constant and the other two variable might indicate that penicillin and streptomycin can be used at much lower levels without loss of efficacy. Lowest effective levels should be given special attention when working with sheep, for economics play an important role in the problem of treating this class of livestock.

That part of the study pertaining to the tolerance of chicken embryos for magnamycin was characterized by some nonuniformity. It was not apparent whether the deaths shown in table 7 were due to magnamycin toxicity or to nonspecific causes. Low toxicity of this antibiotic for several animal species has already been established.[4]

Since this is the first report of antibiotic activity against bluetongue virus, it should be worth-while to subject the work to replications and alterations in technique. For example, embryo-protection experiments are suggested. With this technique, eggs are inoculated with the antibiotics at stated intervals prior to inoculation of the virus.

Workers who have tested the susceptibility of viral agents to magnamycin should be encouraged by this report to reconsider their negative results and to investigate the possibility that some of those viruses may be susceptible to the synergistic action of magnamycin with other antibiotics.

TABLE 5—Susceptibility of Bluetongue Virus to Penicillin and Magnamycin Combined

Inoculum (0.2 ml./egg)	No. eggs	Survivors (days postinoculation) 1	2	3	4	5	6	7
Virus Penicillin Magnamycin (12.5 mg./ml.)	5	5	5	5	5	5	5	5
Virus Penicillin Magnamycin (7.5 mg./ml.)	5	5	5	1	0	0	0	0
Virus Penicillin Magnamycin (2.5 mg./ml.)	5	5	5	1	1	1	1	1
Virus Penicillin Magnamycin (1.25 mg./ml.)	5	5	4	0	0	0	0	0

TABLE 6—Effect of Varying Levels of Magnamycin Alone on Bluetongue Virus

Inoculum (0.2 ml./egg)	No. eggs	Survivors (days postinoculation) 1	2	3	4	5	6	7
Virus Magnamycin (12.5 mg./ml.)	5	5	5	0	0	0	0	0
Virus Magnamycin (17.5 mg./ml.)	5	5	5	5	5	5	5	2
Virus Magnamycin (22.5 mg./ml.)	5	5	5	5	5	5	5	5
Virus Magnamycin (37.5 mg./ml.)	5	5	5	5	5	5	5	5
Virus Magnamycin (50.0 mg./ml.)	5	5	5	5	5	5	5	5

TABLE 7—Tolerance of Chicken Embryos for Magnamycin

Inoculum (0.2 ml./egg)	No. eggs	Survivors (days postinoculation) 1	2	3	4	5	6	7
Broth Magnamycin (12.5 mg./ml.)	5	5	5	5	5	5	5	5
Broth Magnamycin (17.5 mg./ml.)	5	5	4	4	4	4	4	4
Broth Magnamycin (22.5 mg./ml.)	5	5	5	4	4	4	4	4
Broth Magnamycin (50.0 mg./ml.)	5	5	5	5	5	5	5	5
Broth Magnamycin (37.5 mg./ml.)	5	4	4	4	4	4	4	4

SUMMARY AND CONCLUSIONS

A series of three experiments has shown that magnamycin alone is effective against the Sonora strain of bluetongue virus, when tested *in ova*, at a level of 17.5 mg. per milliliter of inoculum but not at 12.5 mg.

It was further shown that a level of magnamycin as low as 12.5 mg. per milliliter was effective against the virus if the inoculum also contained streptomycin or penicillin or both.

Chicken embryos exhibited a remarkable tolerance for magnamycin in doses as high as 10 mg. per embryo.

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[2]Bergey, D. H., Breed, R. A., Murray, E. G. D., and Hitchens, A. P.: Bergey's Manual of Determinative Bacteriology. 6th ed. Williams and Wilkins, Baltimore, 1948.

[3]Price, D. A., and Hardy, W. T.: Isolation of the Bluetongue Virus from Texas Sheep—Culicoides Shown to Be a Vector. J.A.V.M.A., *124*, (1954): 255-258.

[4]Booklet of unpublished data entitled "Magnamycin." Chas. Pfizer and Co., Inc., Brooklyn, Oct. 31, 1952.

Another Veterinarian with Strain 19 Brucellosis

Recently, a young veterinarian, while vaccinating calves with *Brucella abortus*, strain 19, vaccine, accidentally nicked the epidermis of his hand with the needle. In fifteen minutes, he felt pain and in three hours the hand was markedly swollen and tender. In eight hours, he had chills, headache, myalgia, arthralgia, and a temperature of 102 F. Starting the next day, he was given, at six-hour intervals, 25 mg. of cortisone for two days and 25 mg. of terramycin® for several days. Most of the symptoms abated in a few hours but gradually returned by the third day after the cortisone had been discontinued. He was then hospitalized, given local hot pack and terramycin therapy but no more cortisone. By the tenth day after injury, he was again afebrile, the wound had opened spontaneously, and the clear serum exudate revealed only *Micrococcus pyogenes*. Recovery was slow and marked by fatigability.

The patient had been negative to the agglutination tests while a student, nineteen months previously, but later developed a titer of 1:100 after delivering an infected cow. His titer, when first treated after nicking his hand, was 1:60 and on the sixth day 1:160. Blood cultures were negative but none were made prior to therapy.—*J.Am.M.A., July 10, 1954.*

[This is at least the fifth such case reported (*see* the JOURNAL, Feb., 1954: 92, and May, 1954: 57).—ED.]

Chinchilla Industry Has Pelt Sale

The initial offering of chinchilla pelts occurred at a sale in New York on June 21. The top 4 per cent brought just over $100 per pelt, the over-all average being $36.77. About half of the skins collected were offered and about 45 per cent of the pelts offered were sold. Interest was high, some furriers from abroad being represented but buying was cautious, many furriers being inexperienced in working with the fur of the chinchilla.—*F.C.C.A. Bull., July, 1954.*

The Epizootic Score Card

Anthrax in a Variety of Zoo Animals.—Twenty outbreaks of anthrax in seven states—eight in Mississippi and four in Louisiana—were reported in June, 1954. All were cattle losses (32 head) except in Seattle, Wash., where 24 zoo animals died as a result of being fed meat salvaged from a dead zoo pony that showed no lesions typical of anthrax. These losses included 2 badgers, 3 bobcats, 2 coati-mundi, 3 cougars, and 14 raccoons. Six other cats which showed early symptoms and all of the exposed lions, tigers, and other feline animals were treated with antibiotics.—*U.S.D.A.*

The Humps of African Cattle

The hump on the withers of different breeds of African cattle vary. In the long-horned Zebu and the Sanga, the hump is over the sixth or seventh cervical to the fourth or fifth thoracic vertebrae. It is formed by the cervical part of the rhomboideus muscle and is not a storage place for nutritive fat.

In the short-horned Zebu, the hump is over the first to the sixth to ninth thoracic vertebrae, the muscular framework is from the thoracic part of the rhomboideus muscle, and does serve as a storage place for fat.—*Austral. Vet. J., Jan., 1954.*

P.S.—44

A Plastic Dressing for Burns

The demands of atomic warfare include a revision of the traditional methods of burn therapy. To meet the need for a rapidly applicable dressing for use in mass local therapy of burns, experiments were conducted using a polyvinyl plastic, xl, dispensed from an aerosol bomb (xl aeroplast).

Third-degree burns involving 20 per cent of the body surface were administered to 11 pigs, 8 of which were treated with aeroplast and 3 left untreated as controls. Because of the histological similarity between swine and human skins, weaned, healthy, male and female Chester White pigs, 6 to 8 weeks old, were used. After making complete blood counts at intervals, the animals were anesthesized and the clipped dorsal body surface was burned through windows in a ¼-inch asbestos sheet with a blow torch. These third-degree burns were sprayed with aeroplast with the exception of the control animals on which open-air therapy was employed.

Six of the 8 principals exhibited complete regeneration of the skin, with moderate cicatrix formation in twenty-four to thirty-seven days after being burned. When necropsied, the only significant pathological findings were cloudy swelling of the liver in 1 of the 6, and focal hydropic degeneration of the renal tubular epithelium in another. Of the other 2, 1 exhibited 85 per cent skin regeneration at death, which was due to pneumonitis, bacteremia, and metastatic abscesses in the liver and gastrointestinal tract. The other died after eight days, with sloughing of the burned tissues and no healing, death being due to acute lobar pneumonia and focal necrosis of the liver.

Of the 3 controls, 1 exhibited about 68 per cent skin regeneration at death from bronchopneumonia twenty-eight days after the burn; 1 died on the eighth day with the burned tissue sloughing, due to so-called "burn toxemia" characterized by cloudy swelling of the kidneys and diffuse punctate hemorrhages in the adrenal cortex, pulmonary parenchyma, epicardium, and gastrointestinal tract; and the third exhibited complete regeneration of the skin after forty-three days, with no pathological changes observed at necropsy.

The plastic dressing was exposed to traumatic conditions such as repeated chewing and abrasion against a wire fence; conditions which would not occur in the case of a human patient.

Of 1,052 human (voluntary) subjects to whom a patch test with aeroplast was applied, 8 (0.76 %) showed a local reaction. By contrast, approximately 20 per cent of the group to whom a band-aid was applied exhibited mild to severe reactions. Aeroplast is also being clinically evaluated as a dressing for surgical wounds, such as those of a skin graft donor.

The many advantages of this new form of burn therapy are: (1) When sprayed on the wound the plastic dries quickly; (2) it seals bacteria out and vital fluids in; (3) the treated area can be washed; (4) the condition of the wound can be observed through the transparent bandage; (5) it is time-saving; (6) its feasibility for use by relatively untrained personnel; (7) its applicability to parts of the body poorly adapted to pressure dressings; (8) its flexibility; (9) its portability for use under field conditions; (10) it minimizes storage problems; and (11) it avoids a tourniquet effect.

Revision of burn therapy techniques, demanded by an atomic era, has resulted in a new method of local treatment, using a sprayable polyvinyl plastic. It has been used on a limited number of porcine and human subjects with excellent results. Six of 8 treated pigs survived, with healing completed in twenty-four to thirty-seven days, whereas only 1 of 3 controls survived and healing required forty-three days.

Abstract of "A New Local Treatment of Burns" by Capt. Daniel S. J. Choy, M.C., U.S.A.F. (now a resident physician at Bellevue Hospital, New York City); and Capt. Wallace E. Wendt, V.C., U.S.A.F. (now a practitioner in Cleveland, Ohio), which appeared in the United States Armed Forces Medical Journal (Sept., 1952). The abstract was submitted by Major F. W. Clayton, V.C.

Histoplasmosis in Man Not Rare

Studies in Ohio indicate that the incidence of histoplasmosis coincides with the distribution of histoplasmin reactors and pulmonary calcifications. Rather than being almost universally fatal, it well may be a common infection with relatively few fatalities. The course may vary from a vague illness lasting a few days or weeks to a fulminating fatal disease.—*J.Am.M.A., March 27, 1954.*

Cleft Lips and Cleft Palates.—Of 100 human patients with cleft lips or cleft palates, both conditions were present in 51, the palate alone was affected in 36, and the upper lip alone in 13. The condition was more common in males, and 18 per cent of the patients had a relative with a cleft.—*Brit. M. J., Feb. 6, 1954.*

Bovine Photosensitization

In January, 1954, in Alberta, a Holstein-Friesian cow was confined in a poorly lighted stable; then, when the weather moderated she was turned out in the sun. Later, the white portions of the skin peeled while the black remained normal. Except for a transitory swelling under the jaw and neck, the cow otherwise remained normal. She apparently had been sensitized to the sun's rays by her diet of alfalfa hay while confined.—*J. Comp. Med., June, 1954.*

SURGERY & OBSTETRICS
AND PROBLEMS OF BREEDING

A New Method of Treatment of Oblique Supracondylar Fractures of the Femur with Collision Cruciate Screws

Captain MORTON WOLF, V.C., U. S. Army
Fort Riley, Kansas

EFFECTIVE reduction of supracondylar fractures of the femur presents a real challenge to the veterinary surgeon. The short distal fragment does not lend itself to proper reduction and immobilization and, unless these are effected, a definite lameness and permanent deformity may result. A fracture in this area invariably results in anterior displacement of the proximal fragment and posterior displacement of the short distal fragment. Thus an over-riding occurs. This displacement is due to the powerful thigh muscle, quadriceps femoris, acting on the proximal fragment to flex the hip; and the gastrocnemius and superior digital flexor acting on the distal fragment to flex the stifle joint.[1]

At present, reduction may be accomplished by one of the following methods:

1) If the fracture is seen prior to development of marked swelling, manual reduction may occasionally be accomplished by "flexion of the stifle joint with the tarsus extended and applying downward traction to the posterior surface of the proximal part of the tibia."[2]

2) In some instances, the combined use of tongs, the Gordon extender, and modified Thomas splint may result in proper reduction.[3,13]

When the above methods fail, open reduction must be employed. Here the surgeon may use one of several methods depending on the severity and type of fracture and the equipment available. The following methods have been employed:

1) With a long distal fragment, an intramedullary pin can be inserted with or without the additional support of a Thomas splint.[4,5,6]

2) Vitallium bone plating.[7,8]

3) With a short distal fragment, a Stader splint,[9] Kirschner pin, or the Ehmer modification of the Roger Anderson equipment[10,11] may be satisfactorily used.

The closed methods of fracture reduction are often unsuccessful in the more complicated cases. The open methods described also leave much to be desired in the treatment of oblique or spiral supracondylar fractures with short distal fragments. A new method of treatment for such oblique fractures consists of open reduction with fixation of the fragments by cruciate screws, a simple, inexpensive method which allows early ambulation without splints, wires, or nails fixed externally. This method has been used successfully by orthopedic surgeons in the treatment of human fractures for years.[12] It is a logical approach to the treatment of similar fractures in small animals.

Recently, an animal presented with an oblique, short distal fragment, supracondylar fracture was treated in the above manner, and the animal made an excellent recovery.

CASE REPORT

A 7-month-old, 35-lb., male Spitz was struck by an automobile. Roentgenograms revealed a slightly comminuted, oblique, supracondylar fracture of the femur just proximal to the epiphysis and involving the femorotibial articulation. The nature of the fracture was such that closed reduction would not maintain adequate fixation. It was believed that open reduction with collision cruciate screw fixation would offer less opportunity for displacement and would also permit almost normal mobility in the immediate postoperative phase.

OPERATIVE PROCEDURE

The animal was prepared for surgery in the usual manner, with pentobarbital sodium the anesthetic of choice. The entire leg was clipped, washed

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Captain Wolf was a small animal practitioner at Roslindale, Mass., prior to his admittance to the Veterinary Corps, U. S. Army, in 1952. He is now stationed at Fort Riley, Kan.

Grateful acknowledgment is extended to Capt. Alvin O. Uhle, M.C., for his assistance and advice.

The opinions expressed in this article are those of the author and are not to be construed as official or reflecting the views of the United States Army Veterinary Corps.

with tincture of green soap and water, and cleansed with ether. Alcohol, 70 per cent, and zephiran, 1:1,000 were used to complete the preparation. The area was draped with sterile towels and a shroud. A 6-inch elliptical incision was made in the skin over the stifle joint extending dorsoventrally. The fascia lata was incised and the aponeurosis of the insertion of the biceps femoris was split in its line of fibers and retracted. The fractured fragments were then exposed with the aid of a Bennett tibial retractor.

Complete reduction was impossible at this point. The fermoropatellar capsule was incised, allowing more complete visualization and exposure of the fragments. The proximal and distal fragments were then reduced and held in place with a Lowman's bone-holding clamp. Two holes were drilled through the fractured fragments by means of a universal two-speed hand drill. A depth gauge was employed to determine the exact depth of the holes. Two collision screws, that would penetrate both fragments and remain approximately flush with the posterior surface of the bone, were inserted in the holes and screwed tight.

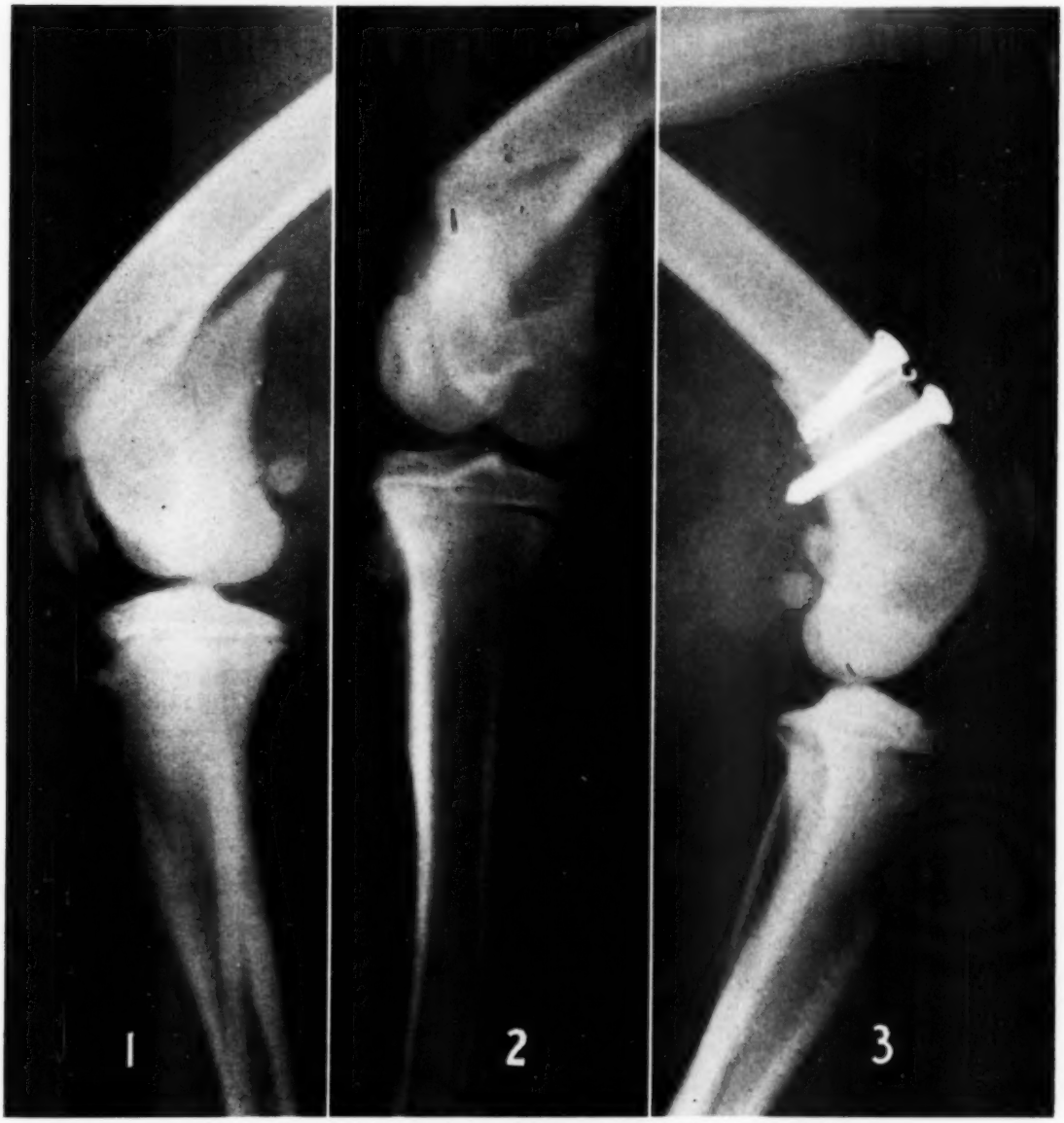

Fig. 1—Preoperative lateral view of the fractured left femur of the Spitz.
Fig. 2—Preoperative anteroposterior view of the left femur.
Fig. 3—Postoperative lateral view of the fractured left femur.

For further fixation, a loop of No. 28-gauge stainless steel wire was placed around the fragments between the two screws and wound snug. Fixation was then checked; complete immobility had been attained. The femoropatellar capsule, patellar ligament, aponeurotic insertion of the biceps femoris, fascia lata, and skin were then approximated by rows of continuous suture with No. 00 chromic catgut. No other form of fixation was used on the leg.

Fig. 4—Postoperative anteroposterior view of the fractured left femur of the Spitz.

Fig. 5—Lateral view of the fracture three weeks after it was fixed with collision cruciate screws.

Four days after the operation, the animal extended the leg occasionally and supported some weight while standing. Two weeks after the operation, the animal had regained approximately 25 per cent use of the leg; and at six weeks, the owner stated that her "dog was able to perform all normal activities." A slight limp became evident only after strenuous exercise.

SUMMARY

A method of handling oblique or spiral fractures of the distal end of long bones is presented. It is especially desirable in short fragment fractures or in those fractures with joint involvement, since almost perfect reduction and fixation is necessary for good results. Favorable end results may be expected if proper surgical techniques are followed.

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Aseptic Wound Fever.—In large animals, following surgery with considerable tissue damage, a temperature even up to 105 F. without other reactions is not an indication of generalized sepsis.—*Surgical Principles and Technics by W. F. Guard. 1953 ed.*

Embryonic Mortality Associated with Bulls of Low and High Fertility

When 15 heifers were slaughtered three days after being bred to bulls of low fertility, 80.0 per cent revealed normally cleaved ova compared to 95.5 per cent of 21 heifers bred to bulls of high fertility.

When similar groups were slaughtered thirty-three days after breeding, embryos were found in 46.7 per cent of cows bred to bulls of low fertility and in 80.9 per cent of cows bred to bulls of high fertility. This indicates an embryonic mortality, in thirty days, of 33.3 per cent attributed to the bulls of low fertility and of 14.6 per cent to those of high fertility.—*J. Dai. Sci., June, 1954.*

Storage Temperature of Sperm in Birds.—In most mammals the testes are located outside the body cavity, supposedly because a lower than body temperature is required for sperm maturation. In birds, the testes are located in the abdominal cavity but the sperm are not motile until they reach the seminal vesicles (glomera), located quite superficially at the cloaca, where the temperature ranges from 5.5 to 9.0 degrees lower than where the testicles are located.—*Science, July 9, 1954.*

Factors Affecting Heifer Puberty.—Studies on 67 Holstein-Friesian heifers indicated that inbreeding and calfhood scouring increased the age of puberty by retarding growth. Heifers born in the spring reached puberty at a significantly earlier age than those born in other seasons. Whereas heifers have been reported to reach puberty at 4 to 8 months of age, the average age in this group was 397 days.—*J. Dai. Sci., March, 1954.*

Prevention of Human Abortion

Adequate dosage of stilbestrol may, in the absence of sufficient vitamins B or C, fail to prevent abortion. However, when each was adequately supplemented, only two interrupted pregnancies (1%) occurred in a series of 200 pregnancies, 90 of which were habitual aborters. The dosage of stilbestrol was gradually increased with the stage of pregnancy and greatly increased if signs of threatened abortion appeared.—*Am. J. Surg., Jan., 1954.*

Use of Equine Gonadotropin in Bovine Functional Infertility

H. J. HILL, D.V.M.

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Breeding efficiency is a most important factor in the economics of cattle husbandry. Veterinarians have observed that the incidence of cows coming into heat, but failing to conceive, has increased greatly in recent years. More cows are being culled because of sterility than for any other reason except low production.[1]

Ovulation failure or delayed ovulation account for a great many cases of so-called "functional sterility." Although hormone therapy has been applied extensively in correcting these conditions, the literature seldom refers to a specific hormone. This paper is a report on the use of the equine gonadotropin, gonadogen,®* in typical cases of functional infertility in the cow.

MATERIALS AND METHODS

Materials.—In 1930, Cole and Hart[2] discovered a new source of gonad-stimulating hormone in the blood of pregnant mares. Later studies demonstrated that this hormone from mare's serum brought about a stimulating effect on gonads similar to that produced by anterior pituitary extracts. The application of this research to the field of veterinary medicine was apparent.

Gonadogen is now prepared from crude pregnant mare serum plasma.[3] The hormone fraction is obtained in a state of high purity as a dry, white, water-soluble powder. Potency is expressed in Cartland-Nelson units.[4]

The preparation is packaged as powder in rubber-capped vials. It is supplied with a vial of physiological saline, from which a sterile solution may be prepared. Administration is by subcutaneous, intramuscular, or intravenous routes.

Methods.—This study is comprised of 50 cases of "repeat breeders" with no diagnosed tubular or ovarian pathology. All cows were examined during each of three inseminations before being declared functionally infertile. If these animals returned to estrus within an eighteen- to twenty-three-day cycle, they were not bred and 50 units of gonadogen was administered subcutaneously or intramuscularly during the proestrous phase of the next cycle. Animals were, therefore, injected on the sixteenth or seventeenth day after they had passed the heat period.

RESULTS

Results of gonadogen therapy were determined by: (1) rectal examination ten to thirty days after the injection to determine the presence of an active corpus luteum; (2) sexual behavior indicating deviations from the normal pattern of the animal under treatment; (3) results of subsequent breedings as determined by rectal examination at forty to sixty days after breeding.

TABLE I—Results of Treatment of 50 Cases of Bovine Functional Infertility with One Injection of Gonadogen

	Cows	
	(No.)	(%)
Conceived following one treatment, one breeding	22	44
Conceived following one treatment, two breedings	9	18
No conceptions	19	38

DISCUSSION

Hormonal treatment of the repeat breeder cow is advisable only if an accurate record of the herd and individuals within the herd is available. If the percentage of repeat breeders is relatively high in a particular herd, then the clinician should look for the basic cause which will probably turn out to be some type of infection, some nutritional problem or, not uncommonly, some management factor. The sporadic repeat breeder within herds having an otherwise satisfactory conception rate, or the family cow who will not conceive, are the cases which often respond to hormonal treatment. The injections of gonadogen in this clinical summary were given to those individuals who had exhibited clinically normal estrous periods eighteen to twenty-three days apart, who had been inseminated with semen of known quality three or more times, but had not yet conceived. The injections on the sixteenth or seventeenth day after estrus did not seem to change the period of expected heat. Estrus usually occurred at about the same interval as had been characteristic of the cow previous to the injection.

Each cow was examined rectally on the day the injection was to be given, in order to be sure the corpus luteum was decreasing in size and activity. If the corpus luteum was found to be still large and to give the impression of activity, then the injection was postponed twenty-four or forty-eight hours and the animal again examined. Injection of gonadogen in the presence of an active corpus lutem often maintains the corpus luteum and the animal would then

From the Artificial Breeding Service, Colorado A. & M. College, Fort Collins.

*The Upjohn Company, Kalamazoo, Mich.

not come in heat again for perhaps thirty or forty days.

The cows in this study were clinical cases and the use of controls was not possible. Because spontaneous recovery is possible in such cases, evaluation of treatment is difficult. The recovery rate suggests, however, that conception was largely the result of treatment and not spontaneous in nature.

SUMMARY

Results of gonadogen® therapy in 50 cattle indicate that bovine functional infertility is a condition in which this drug can be applied with economic advantage.

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Electroejaculation of the Bull

An apparatus with a cylindrical electrode to be placed in the bull's rectum has been perfected which will cause erection and ejaculation with a natural fractionation of the semen. The accessory gland fluids which are obtained first can be discarded, then the spermatozoa are obtained in a concentrated form. Two bulls showed no harmful effects after being routinely ejaculated for twelve months.—*J. Dai. Sci., May, 1954.*

Foot-and-Mouth Disease and Fertility.—In 119 cows studied during an outbreak of foot-and-mouth disease in Poland, estrus was either absent or abnormal in 97 during the first month following recovery. After six months, all but 9 had returned to normal and 97 became pregnant.—*Vet. Bull., June, 1954.*

Electrical Ejaculation of the Bull.—A simple gadget, consisting of wired copper rings fitted on the fingers of a rubber glove, when carried into the rectum of the bull and held on either side of the seminal vesicles and ampullae successfully stimulates ejaculation.—*Vet. Rec., June 5, 1954.*

A Surgical Tip — A Sterile Teat Knife

To keep instruments, such as Lichty's teat knives, ready for use on short notice, each may be carried separately in a test tube or bottle containing liquid phenol with the blade inserted through the solid rubber cork. The cork does not leak and the blades remain sharp, sterile, and free of rust.—*I. A. Walsdorf, D.V.M., New Holstein, Wis.*

Rate of Embryonic Deaths in Ewes

When 180 ewes were inseminated in pairs and 1 of each pair was slaughtered three days later to determine the ovulation and fertility rate, each had ovulated and the average per ewe was 1.47 ova. The experiment indicated that in 38.9 per cent of the ewes the ova were never fertilized, in 20 per cent the embryos had died, and 41.1 per cent had produced lambs.—*J. Anim. Sci., May, 1954.*

Results of Bovine Embryotomy.—In 239 cases of bovine dystocia with embryotomies, delivery was accomplished in all but 2 per cent, maternal death occurred in 6 per cent, retention of the placenta followed in 13 per cent, and conception occurred within six months in 73 per cent and within ten months in 82 per cent.—*Vet. Bull., June, 1954.*

Spraying in Castrated Cats.—Although spraying is usually considered to be associated with the sexual display of entire male cats, it may be encountered in castrated males as the result of emotional causes. Resentment at the introduction of another cat or in the change of familiar objects, such as furniture, might be responsible.—*Vet. Rec., April 3, 1954.*

Controlling Vibrio Fetus in Semen.—Both penicillin and streptomycin exhibit bactericidal action against *Vibrio fetus* in bulls' semen but, of the two, streptomycin is much more effective. In combination, they killed all the *V. fetus* organisms in a heavily infected semen in six hours.—*J. Dai. Sci., April, 1954.*

Congenital Cecocolic Stenosis

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A 14-hour-old Standardbred filly with colicky symptoms, which had become evident at about twelve hours postpartum, was presented for examination. The barn foreman had administered "colic medicine" along with an enema without effect. No bowel movement had been seen. The temperature was normal and rectal digital palpation produced nothing but a small amount of thin, viscid, practically colorless mucus and the feeling of a collapsed rectum.

The foal did not strain. It would rise and try to nurse, but after getting a couple of mouthfuls, it would flex its hind limbs, gradually crumple to a sitting-dog position for a minute or two, then fall on its side and roll. After rolling, it would lie prostrate for a few minutes. This was repeated at intervals commensurate with peristalsis. Tympanites was increasing and the filly's condition worsened steadily.

An intussusception was suspected. Treatment with sedatives and atropine were of no avail.

At about twenty-four hours postpartum, it was decided to perform an exploratory laparotomy. Anesthesia was produced and the field prepared. Upon entering the peritoneal cavity, several feet of small intestine emerged highly distended with gas. It was tapped and deflated. The small intestine was then traced to the cecum without finding evidence of an intussusception. The cecum, however, was engorged with fecal matter. At this point, the foal succumbed and what started as surgery became a necropsy.

The cecum was engorged with meconium, none of which had passed to the colon and rectum which were completely empty. The ileocecal orifice was normal but the cecocolic orifice was extremely stenotic. Thus, another abnormality is added to the many with which a newborn foal can be afflicted.

Dr. Crane is a general practitioner in Porterville, Calif.

Hormones and Retained Placentas.—In a study of retained placentas in cows and mares, neither posterior pituitary extract, estrogens, nor testosterone brought about placental separations.—*Vet. Bull., May, 1954.*

Fertility Duration in Turkeys.—When turkey pullets were inseminated at two- or three-week intervals with either 0.05 ml. or 0.025 ml. of semen, there was no difference in the resulting fertility, hatchability, or poult production. Therefore, insemination with 0.025 ml. of semen at three-week intervals should suffice.—*Poult. Sci., March, 1954.*

Hydrocephalus in newborn calves in Africa, in 1949, was common, concurrently with Japanese equine encephalitis in horses. —*Vet. Bull., Jan., 1954.*

When sows were bred twice at an interval of twelve to twenty-four hours, 23 per cent more settled and an average of 1 more pig per litter was produced.—*Successful Farming, July, 1954.*

Torsion of the omentum is reported in 100 persons, most of whom were adults. It produces a moderate to "colicky" pain which should be relieved by excision. Suggested etiological factors are obesity, trauma, excessive activity, and hyperperistalsis.—*J.Am.M.A., June 19, 1954.*

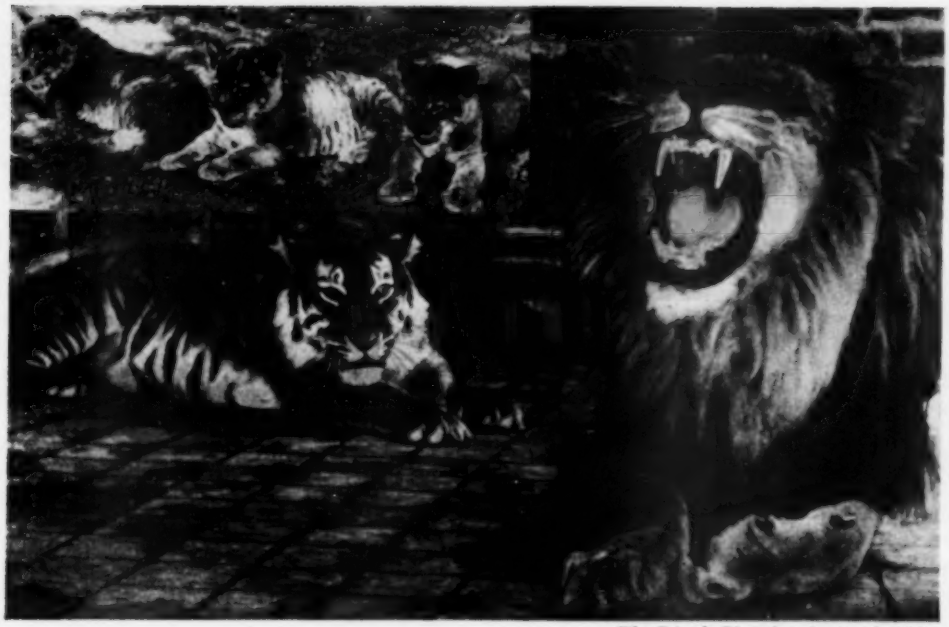
The Liger, a Rare Feline Hybrid

Recently, the female lion-tiger hybrid (liger), Diana, in the Bloemfontein, South Africa, Zoo, died when 18 years old with a carcinoma of the mammary glands and metastatic lesions in several internal organs. According to Dr. A. J. Louw, municipal veterinarian at Bloemfontein, this leaves Rajah, a 19-year-old litter mate, as the only known living liger.

The parents, a Bengal tigress and a black-maned African lion, were raised together from cubhood and produced two litters of 3 cubs each in the Bloemfontein Zoo in 1935 and 1936. Four of these rare hybrids were raised to maturity but 1 female died of septicemia and another was destroyed when she escaped from her cage. Hybrids produced from a male tiger and a lioness, called "tigors," are less unusual.

Rajah weighs 750 lb. and is 9 inches taller and 18 inches longer, head to tail tip, than the average male lion. Attempts to breed him with a lioness, one of which shares his cage, have been unsuccessful.

(See illustrations on opposite page →)



—The Friend, Bloemfontein, South Africa

Fig. 1—Parents of Rajah and Diana, ligers born in the Bloemfontein, South Africa, Zoo in 1935. Inset—Liger cubs born in the Bloemfontein Zoo in 1935, Rajah (center) and Diana (right). The other cub died soon after birth.

—The Friend, Bloemfontein, South Africa

Fig. 3—Rajah, only surviving liger, as he is today in the zoo at Bloemfontein, South Africa, at the age of 19 years.

CLINICAL DATA

A Bacteriological Study of Ten Persistent Reactor Cows Following Vaccination with *Brucella Abortus*, Strain 19

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Madison, Wisconsin

THE ANIMAL vaccinated with *Brucella abortus*, Strain 19, which attains the status of a persistent reactor to the blood serum-agglutination test currently presents one of the more serious and perplexing problems in the control and eradication of bovine brucellosis. It would be difficult to convince an intelligent dairyman, whose herd contains only strain 19-vaccinated suspects or low titer reactors, that such reactors are a danger to brucellosis-free animals. On the other hand, it can not be stated unequivocally that these animals are always noninfected for this is known not to be true. Repeated blood testing of vaccinated suspects (1:50) and low titer reactors (1:100) tends to substantiate the premise that such animals are not dangerous to an otherwise clean herd. Large scale bacteriological culturing of uterine material or milk from a large number of persistent reactors is impractical but, from a scientific standpoint, such an examination would be most desirable and would confirm or disprove the presence of most active bovine infections. Repeated blood tests on what are known as vaccinated persistent reactors discloses that the vast majority show fluctuating titers; also that a considerable number remain suspects or low titer reactors, while some eventually become negative.

In order to ascertain, in so far as possible, the actual or potential danger of strain 19-vaccinated reactors in herds considered to be free of brucellosis, the following investigations, conducted on 10 animals, were undertaken.

MATERIALS AND METHODS

Cows 1 to 6 were purchased from Wisconsin herds which were considered to be free from *Br. abortus* infections. These animals had been officially vaccinated with strain 19 as calves. The observed Brucella serum-agglutination titers tended to fluctuate in the suspect (1:50) or reactor range (1:100 or higher).

Cows 7 to 10 were vaccinated with strain 19 as calves and then revaccinated as adults. They originated in a large commercial dairy herd which was known to have been infected during 1945 to 1948. The herd was studied extensively both clinically and bacteriologically from 1945 to 1950 by Berman, *et al.*[1] It was maintained as a closed herd with no replacements being added since 1946. The last bacteriologically positive reactor was removed in 1948. Since that time, the herd has been considered as brucellosis-free.

The 10 cattle were slaughtered at a local abattoir. Uterine tissue and contents, fetal fluids and tissues, udder and milk, liver, spleen, kidney, and lung or parts thereof, were obtained at necropsy. The prescapular, prefemoral, supramammary, submaxillary, parotid, retropharyngeal, bronchial, mesenteric, gastrohepatic, and iliac lymph nodes were also collected. The tissues were homogenized individually in sterile saline, and 0.1 ml. of the material spread on 4 to 6 Albimi Brucella agar plates. Cream, fetal stomach contents, uterine contents, and fetal organs, when available, were similarly or appropriately treated and cultured. Half the number of inoculated plates were incubated at 37 C. in an atmosphere containing 10 per cent carbon dioxide, while the remainder were maintained in air at the same temperature. The cultures were incubated for at least ten days before being discarded.

Three to 5 guinea pigs were inoculated intraperitoneally with 1 to 2 ml. of the homogenized material from the uterus, fetal tissues, or uterine fluids, while 3 to 5 guinea pigs received homogenized udder, supramammary lymph node, and cream intraperitoneally. The homogenized viscera, prescapular lymph nodes, and the remaining lymph

From the Department of Veterinary Science, University of Wisconsin, Madison. Paper N.S. No. 136. Published with the approval of the director of the Wisconsin Agricultural Experiment Station.

Mr. Robertstad is now on the staff of the Department of Veterinary Science, University of Wyoming, Laramie; and Dr. Ristic is on the staff of the Department of Veterinary Science, University of Florida, Gainesville.

The administrative assistance of the personnel of the Wisconsin Department of Agriculture, Division of Livestock Sanitation, Madison, is gratefully acknowledged. The authors thank Drs. C. A. Brandly and S. H. McNutt for their counsel in planning the investigation.

nodes were respectively inoculated into three other groups of guinea pigs. Half of the inoculated animals were killed two to three weeks after inoculation. Necropsies were performed, splenic material cultured in the same manner as were the bovine tissues, and the Brucella tube-agglutination test conducted on their serums. The remaining guinea pigs were also killed and examined four to eight weeks after inoculation.

Drs. Hess and Roepke[2] devised a technique to differentiate the specific Brucella-agglutinating globulin components of bovine blood from the nonspecific Brucella-agglutinating globulin factors. The bovine serums taken at necropsy were submitted to these investigators to determine the specificity of the agglutination reaction.

RESULTS

Brucella organisms were not isolated from bovine tissues or from the spleens of the inoculated guinea pigs. Agglutinins for Brucella were not found in the serums of any of the guinea pigs.

The Hess-Roepke tests[2] indicated that

TABLE I—History and Serological Data Pertaining to the 10 Persistent Reactors

Cow	Age	Vaccination	Status	Serological tests*	
				Plate or tube test titer	Hess-Roepke test
1	2 yr.	Official calfhood (6/25/49)	7 months pregnant	1/31/51 (P**1:100) 6/20/51 (1:200) 7/24/51 (1:100)	Specific
2	2 yr.	Official calfhood (8/22/49)	Nonpregnant	1/26/51 (P1:50) 6/14/51 (1:100)	Specific and some nonspecific
3	2 yr.	Official calfhood (5/17/49)	5 months pregnant	3/16/51 (P1:100) 8/14/51 (1:25)	Specific
4	3 yr.	Official calfhood (7/29/48)	2 months pregnant	6/6/50 (P1:100) 9/5/50 (1:100) 4/11/51 (1:100) 10/16/51 (P1:100) 12/11/51 (P1:100)	Specific
5	4 yr.	Official calfhood (6/1/49)	8 months pregnant	9/9/50 (P1:100) 2/7/51 (negative) 7/13/51 (P1:100) 12/11/51 (1:100) 1/16/51 (P1:400)	Specific
6	5 yr.	Official calfhood (5/24/47)	2½ months pregnant	5/10/49 (negative 1:50) 8/17/50 (P1:50) 1/16/51 (P1:100) 1/14/52 (P1:50) 3/19/52 (P1:50) 3/26/52 (1:50)	Nonspecific
7	5 yr.	Calfhood 2/8/47 Adult 10/6/48	Nonpregnant	1/21/51 (P1:200) 5/21/52 (P1:200)	Specific
8	5 yr.	Calfhood 12/18/47 Adult 5/31/49	Nonpregnant	5/23/50 (1:100) 1/23/51 (1:50) 3/17/52 (P1:100) 7/21/52 (1:200) 9/9/52 (1:100)	Specific and nonspecific
9	6 yr.	Calfhood 2/5/48 Adult 8/23/49	Nonpregnant	9/10/49 (1:400) 1/23/50 (P1:100) 5/24/50 (1:100) 1/24/51 (1:200) 3/17/52 (1:100) 7/21/52 (P1:200) 1/13/53 (P1:100)	Specific
10	10 yr.	Calfhood 11/4/43 Adult 7/29/47	Nonpregnant	10/25/47 (1:400) 1/20/48 (1:200) 4/19/48 (1:400) 10/25/48 (P1:400) 2/1/49 (P1:200) 6/6/49 (P1:400) 1/17/50 (P1:100) 5/21/50 (P1:50) 1/22/51 (P1:100) 3/17/52 (P1:100) 7/21/52 (1:200) 3/17/53 (P1:100)	Specific

*The last agglutination test result in the column was conducted by the tube test method. All other tests conducted with the rapid or plate method.
**Partial or incomplete agglutination at indicated dilution.

cow 6 had a nonspecific Brucella-agglutinating component in her blood. The serums of cows 2 and 8 gave evidence of both the specific and nonspecific factors. The histories and serological results are summarized in table 1.

DISCUSSION

The presence of the 10 persistent reactors in their respective herds constituted neither an animal nor a human health hazard, in so far as these laborious bacteriological studies could detect. This conclusion is further substantiated since the herds were apparently all free of brucellosis and remained so.

Several theories regarding the cause of low titer-vaccinated reactors have been proposed: (1) Differences should be expected in the individual reticuloendothelial response to strain 19 vaccination, *i.e.*, some cattle are more active agglutinin producers and their titers may retrogress more slowly and finally stabilize at 1:50 or 1:100 and not at 1:25 or lower; (2) exposure to an inapparent field infection following vaccination may create sufficient stimulus to an existing 1:25 titer to cause a rise to the next dilution and keep it at that level for a long period; (3) the possibility that the existing Brucella titer (due to strain 19 vaccination) could be augmented by contact with antigenically related microorganisms of ubiquitous distribution has been proposed;[3-8] (4) Hess and Roepke[2] have demonstrated a Brucella-agglutinating factor in the serums of normal cattle. Such a condition was observed in 3 of the 10 cattle in this study, indicating that the observations of Hess and Roepke are not isolated instances.[9]

It is possible that these four mechanisms, operating either separately or in combination, may be responsible for much of the confusion associated with this very real and practical problem. It is logical to assume that in time as bovine brucellosis, *per se*, is eliminated, that the largest percentage of the low titer level suspects and reactors will be due not to *Br. abortus* but to other factors. As the number of true brucellosis reactors are eliminated from the cattle population, the false or spurious reactors will become numerically prominent and more important.

SUMMARY

Ten strain 19-vaccinated cows, which were persistent reactors to the serum-agglutination test for brucellosis, were subjected to intensive postmortem bacteriological examination. None of the animals was found to be harboring Brucella. These animals apparently did not represent any serious hazard to livestock or human health.

The serums of 3 animals were found to contain the nonspecific Brucella-agglutinating factor of Hess and Roepke.[2]

The problem of the nonspecific persistent Brucella reactors is discussed.

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Induced Histoplasmosis in Dogs

When the yeast phase of *Histoplasma capsulatum* was inoculated intratracheally into 9 healthy dogs, all developed acute progressive fatal histoplasmosis, but 7 dogs similarly inoculated intragastrically showed no clinical effects. However, the mycelian phase of *H. capsulatum* was noninfectious unless the dog's resistance had been reduced with cortisone. They could then be infected intratracheally, unless previous inoculations with the mycelian phase had developed a resistance.—*Vet. Bull., April, 1954.*

Salmonellosis in Turkey Poults as Observed in Routine Necropsy of 1,148 Cases

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Turlock, California

EXCLUDING pullorum disease and fowl typhoid, the organisms of the Salmonella group were primarily or secondarily responsible for approximately 21 per cent of the disease problems with which the turkey growers in this California area were concerned during the six-month period, January to July, 1952. The above percentage was based on the routine necropsy of 1,148 turkeys at the laboratory* during this period. The bacteriological findings were made from an average of three specimens submitted for each bird. With few exceptions, the involved flocks were not observed; therefore, the available information was recorded from the owners or their representatives at the time the turkeys were brought to this laboratory.

This investigation was initiated because of academic interest, but within a short time it was felt that the paratyphoid infections might be a contributing factor in many problem flocks, *i.e.*, flocks that were not responding adequately to treatment for specific conditions, such as coccidiosis or hexamitiasis.

The routine technique for the isolation of the paratyphoid organisms included the use of selenite, desoxycholate, and SS agar for primary enrichment, differential and selective mediums. Results obtained from the use of the triple sugar, semisolid medium suggested by Felsenfeld and Young[2] for *Salmonella para-colon* differentiation were satisfactory. This latter medium, designated as TSM, made up part of the modified screening technique. Of the 243 cultures submitted to the State of California Department of Public Health Laboratory, as Salmonella suspects for typing, only 2 were reported as Bethesda paracolons.

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The authors express their appreciation for the assistance of Dr. Stanton L. Jamison and Miss Clarice Cozart; and of Dr. Alcor S. Browne, California State Department of Public Health, for the serological typing of the cultures.

INCIDENCE OF SALMONELLA TYPES

Compared to the tabulated figures reported by Perelli-Minetti *et al.*[4] in 1948, the incidence of *Salmonella typhimurium* has decreased from 41.4 per cent to 32.7 per cent. During this six-month investigation period, 30 species of Salmonella were typed from 241 isolations resulting from the necropsy of 1,148 turkeys. The number of times each type was isolated, recorded by the poults' age groups, is indicated in table 1. Paratyphoid organisms were isolated from 21 per cent of these turkeys. Of the total birds in which a paratyphoid organism was isolated, 54 per cent were uncomplicated, with no other causative agent to account for the flock problem.

Table 2 presents the incidence of the various types by Salmonella groups and, as indicated, 44.5 per cent were of group B.

TABLE 1—The Incidence of Salmonella Types in Poults from 241 Isolations Recovered from the Following Age Groups in 1952

Salmonella type	Poults' age by weeks								over	Total	
	1	2	3	4	5	6	7	8	9	(No.)	(%)
S. typhimurium	26	10	10	10	6	3	..	5	9	79	32.7
S. anatum	6	14	3	3	3	..	1	..	1	33	13.7
S. give	1	2	2	4	2	2	..	..	1	14	5.8
S. manhattan	4	3	2	2	..	1	..	..	..	12	5.0
S. newport	1	2	4	..	1	..	1	..	1	10	4.2
S. cubana	1	6	1	2	..	..	..	..	..	10	4.2
S. derby	..	..	3	1	1	4	..	..	..	9	3.7
S. kentucky	1	1	3	1	1	1	..	..	1	9	3.7
S. oranienburg	..	..	..	1	..	3	2	..	..	6	2.5
S. worthington	..	3	..	3	..	..	..	..	..	6	2.5
S. senftenberg	..	2	2	1	..	..	1	..	..	6	2.5
S. bredeney	..	1	1	2	..	1	..	..	..	5	2.1
S. san diego	2	2	..	1	..	..	..	..	..	5	2.1
S. california	..	1	2	1	..	..	1	..	..	5	2.1
S. minnesota	..	1	..	1	2	..	..	..	..	4	1.6
S. meleagridis	..	..	2	..	1	..	..	..	..	3	1.2
S. newington	..	1	1	..	..	1	..	..	..	3	1.2
S. thomasville	..	2	..	..	1	..	..	..	..	3	1.2
S. panama	..	1	..	..	..	..	..	1	1	3	1.2
S. poona	1	1	..	..	..	..	..	..	..	2	*
S. chester	..	..	1	..	1	..	..	..	..	2	..
S. muenchen	..	1	..	..	1	..	..	..	..	2	..
S. tennessee	..	1	..	1	..	..	..	..	..	2	..
S. paratyphi B	..	1	1	..	..	..	..	..	..	2	..
S. london	..	1	..	..	..	..	..	..	..	1	..
S. takoradi	..	..	..	..	..	..	..	..	1	1	..
S. uganda	..	..	..	1	..	..	..	..	..	1	..
S. rubislow	..	1	..	..	..	..	..	..	..	1	..
S. bareilly	..	1	..	..	..	..	..	..	..	1	..
S. montevideo	1	..	..	..	..	..	..	..	..	1	..
Total	44	59	38	35	22	16	6	6	15	241	

*Less than 1 per cent.

Salmonella typhimurium accounted for 46.5 per cent of the uncomplicated paratyphoid outbreaks. Hinshaw *et al.*[3] in 1944 reported the isolation of 19 types from turkeys, and *S. typhimurium* accounted for about 60 per cent of the paratyphoid outbreaks.

TABLE 2—Occurrence of Salmonella Types in Poults by the Antigenic Groups in 1952 (Kauffmann-White Schema)[3]

Group	Total	Per cent
B	107	44.5
C	44	18.2
D	3	1.2
E	61	25.3
F	1	0.4
G	18	7.5
Others	7	2.9
Total	241	100.0

CLASSIFICATION

An attempt was made to assign the cases in which a Salmonella organism was isolated into five groups: (1) systemic; (2) uncomplicated enteritis; (3) complicated enteritis; (4) other findings; and (5) no visible lesions.

1) Those with systemic lesions and inflammatory changes such as pericarditis, necrotic foci in the liver and heart, air sac involvement, central nervous system disturbance, and severe catarrhal enteritis with cecal cores, composed 20.8 per cent of the specimens.

2) Cases with a severe catarrhal enteritis and a few with only intestinal stasis with a marked cecitis, but without systemic changes, made up 33.2 per cent.

3) The cases which had varying degrees of enteritis but were complicated by the presence of Coccidium, Hexamita, or sinusitis-air sac infection accounted for 28.4 per cent.

4) Birds examined and diagnosed for conditions other than salmonellosis, such as water starvation, ascites, mismanagement, injuries, mycosis, Leukocytozoon infection, etc., comprised 15.0 per cent of the submitted turkey specimens.

5) Birds recorded as having "no visible lesions" involved 2.5 per cent of all the cases.

OBSERVATIONS

The flocks that had coccidiosis or hexamitiasis and did not respond favorably to the specific medication were often infected with a paratyphoid organism. Usually, the clinical picture in these flocks was that they would respond somewhat by the second or third day of treatment and then many birds would have a relapse about the third or fourth day after their apparent recovery period. This regression after the initial response to medication occurred in many of the 28.4 per cent of the complicated enteritis cases.

This observation supported our expressed views that many of the complicated enteritis cases were influenced by some predisposing condition. Not only do factors such as chilling, unsanitary conditions, crowding, and overheating enhance the opportunity of disease spread and increase the severity of the infection, but the presence of other infectious agents, although latent, can be responsible for retarding the anticipated response of a flock. Therefore, the paratyphoid-infected birds had to be considered when a course of treatment was outlined for a given flock. On the basis of these observations, many potential flock problems were averted.

Of the birds from which *S. typhimurium* was isolated, 45.5 per cent were poults within the first 2 weeks of age and with an average mortality of 12.0 per cent. Of the *Salmonella anatum*-infected poults, 60.6 per cent were less than 2 weeks old; in this group, there was an average mortality of 5.0 per cent. Coccidiosis or hexamitiasis was the primary cause of the loss in 45.5 per cent of the cases from which *S. anatum* was isolated, and only

TABLE 3—Incidence of Salmonella Types and Their Occurrence in the Respective Gross Pathology Findings (1952)

Salmonella type	Systemic	Enteritis: Uncomplicated	Enteritis: Complicated*	Other conditions**	No visible lesions
S. typhimurium	38	23	7	8	3
S. anatum	3	15	10	4	1
S. give	1	4	4	4	1
S. manhattan	1	8	2	1	..
S. newport	1	4	4	1	..
S. cubana	..	3	5	2	..
S. derby	..	1	3	5	..
S. kentucky	1	4	3	1	..
S. oranienburg	2	2	1	1	..
S. bredency	..	1	2	2	..
S. san diego	2	1	1	1	..
S. worthington	..	1	3	1	..
S. senftenberg	..	1	4	1	..
S. minnesota	..	1	2	1	..
S. meleagridis	..	1	2	..	..
S. newington	..	2	1	..	..
S. california	..	1	3	1	..
S. thomasville	..	1	2	..	..
S. panama	..	1	2	..	..
S. poona	..	1	1	..	..
S. montevideo	..	1	..	..	..
S. chester	..	1	1	..	..
S. muenchen	..	..	2	..	..
S. tennessee	..	1	1	..	..
S. paratyphi B	..	1	1	..	..
S. london	..	..	..	1	..
S. takoradi	..	..	..	1	..
S. uganda	..	1	..	..	..
S. rubislow	1	..	..	..	..
S. bareilly	..	..	..	..	1
Total	50	81	68	36	6
Percentage	20.8	33.6	28.4	15.1	2.5

*Coccidiosis, hexamitiasis, trichomoniasis, sinusitis-air sac infection, ascariasis.

**Ascites, water starvation (nephritis, dehydration), Leukocytozoon infection, blackhead, arthritis, etc.

12.7 per cent of the cases in which *S. typhimurium* was found.

The uncomplicated *Salmonella give* outbreaks were characterized by a catarrhal enteritis and a mortality of less than 2.0 per cent. Four of these outbreaks had a history of some flock setback, such as chilling.

The *Salmonella manhattan* and *S. typhimurium* outbreaks were somewhat similar. The average mortality was approximately 10.0 per cent, and 84.5 per cent of the isolations were from uncomplicated enteritis cases with 58.0 per cent of the isolations from poults up to 2 weeks of age.

TABLE 4—Comparison of the Incidence of Salmonella Types in Poults in Successive Years

Salmonella type	January to July 1952	1953
S. typhimurium	79	26
S. anatum	33	7
S. newport	10	5
S. give	14	3
S. bredeney	5	3
S. cubana	10	2
S. derby	9	2
S. oranienburg	6	2
S. san diego	5	2
S. montevideo	1	2
S. manhattan	12	1
S. worthington	6	1
S. california	5	1
S. minnesota	4	1
S. meleagridis	3	1
S. newington	3	1
S. panama	3	1
S. muenchen	2	1
S. tennessee	2	1
Others	29	–
Total isolations	241	63
Turkey necropsies	1,148	585
Salmonella isolations (%)	21	10.76

Salmonella newport accounted for an 18.0 per cent loss in a flock of 6,500, 3-week-old Beltsville White poults over a four-day period. Isolations were from the pericardium, air sac, and intestines. Another flock of 3-week-old Beltsville White poults had a 12.0 per cent loss, and necropsy revealed a severe catarrhal enteritis.

Salmonella cubana was isolated from 10 turkeys, 7 of which had coccidiosis or hexamitiasis as the probable primary disease.

Salmonella derby, Salmonella kentucky, and *Samonella bredeney* were not responsible for any severe paratyphoid outbreaks. Each type was recovered from cases of coccidiosis or hexamitiasis. One flock of 8-day-old Broad Breasted Bronze poults in which *S. kentucky* was isolated had a 3.0 per cent loss.

Salmonella oranienburg was not isolated from poults less than 4 weeks of age. A catarrhal enteritis was the consistent finding in the uncomplicated cases.

Salmonella senftenberg apparently did not cause much trouble; 84.5 per cent of the isolations were from birds with coccidiosis or hexamitiasis.

In two paratyphoid outbreaks due to *Salmonella san diego,* there was a loss of about 10.0 per cent in 1-week-old poults.

One flock of 4-week-old Broad Breasted Bronze poults, in which *Salmonella minnesota* complicated a coccidiosis outbreak, suffered a loss of 16.9 per cent. The flock, which had been treated with a sulfonamide for coccidiosis, had very few losses, but it was not responding adequately as evidenced by a generalized listlessness and inappetance. Twenty-four hours after medication was terminated, the mortality started to increase until treatment against the paratyphoid organism was initiated, at which time there was a marked flock improvement and a dramatic drop in mortality.

Salmonella newington accounted for a 7.9 per cent loss in a flock of 2-week-old Broad Breasted Bronze poults, and a 34.8 per cent loss in a flock of 3-week-old Broad Breasted Bronze poults. Both cases were characterized by a severe catarrhal enteritis.

Salmonella montevideo was responsible for an 8.0 per cent loss in a flock of 6-day-old Broad Breasted Bronze poults. A flock of 8,700, 11-day-old Broad Breasted Bronze poults had a mortality of 11.0 per cent and *Salmonella thomasville* was consistently isolated from the specimens submitted for examination.

Table 3 indicates the gross pathology findings and the incidence of paratyphoid types in the various groups. Table 4 compares the incidence of Salmonella-type infections in 1952 and 1953.

CONTROL MEASURES

Terramycin® and chlortetracycline (aureomycin) were the drugs of choice in controlling paratyphoid outbreaks. These antibiotics were also extremely useful in treating the majority of the complicated enteritis cases. The therapy recommendations were influenced by the severity of each outbreak, *i.e.*, whether it was a flock problem or if only individual birds were involved. In flock problems, it was advisable to use the water-soluble form of the antibiotic. When available, terracon-180* was used extensively; otherwise, the growers used the feed supplement form of terramycin or chlortetracycline. A few attempted to use a water suspension of the feed supplement form of the antibiotic but the results of this method were too erratic to warrant a recommendation for its use.

The effective concentrations were 100 p.p.m. of soluble terramycin in the water, and 250 Gm. of terramycin or chlortetracycline per ton of feed.

The flocks that were having heavy losses and were "off feed" were treated with medicated water and feed. The duration of

*Produced by Chas. Pfizer & Co., Inc., Brooklyn, N. Y.

treatment was determined by the flock response. Unless the case was complicated by Hexamita or Coccidium organisms, there was usually a marked decrease in mortality within thirty-six to seventy-two hours after the antibiotic therapy was initiated. The feed consumption would start to increase about the same time the mortality dropped and would return to a normal level in about four to five days. Therefore, the antibiotic would be maintained in the feed for five days, but in the water only until the third day.

As an adjunct to medication, the addition of new litter on the second or third day of treatment was recommended.The ranchers that followed this practice reported fewer outbreaks in adjacent noninfected pens and a lower incidence of recurrence in the treated flocks.

The majority of the uncomplicated paratyphoid outbreaks during this period were controlled without the use of any sulfonamides. The few flocks in which a sulfonamide was used had a higher percentage of losses and stunted birds than did the antibiotic-treated group.

DISCUSSION AND SUMMARY

The routine culturing of all turkey poults submitted to this laboratory for examination during January to July, 1952, served the turkey industry of this area in two ways: (1) The results called attention to the current paratyphoid problem; (2) it demonstrated the value of the routine poult necropsy for detecting paratyphoid-infected flocks.

The data derived from a comparison of the number of turkeys submitted, the percentage of paratyphoid isolations, and the incidence of *Salmonella typhimurium* in the same months during 1953 indicates the value of the *S. typhimurium* testing service which has been operating in California for approximately four years.[1]

The number of turkeys submitted to this laboratory during January to July, 1953, was 50.9 per cent less than in the same period in 1952. The percentage of paratyphoid isolations from these cases during this same period was similarly reduced; 21.0 per cent in 1952, and 10.76 per cent in 1953. Several factors may have been responsible for the approximate 50 per cent decrease in the incidence of paratyphoid isolations: (1) The results of the *S. typhimurium* blood test influenced owners to dispose of some flocks previously intended for breeders; (2) a few paratyphoid-infected flocks were discarded as breeders because of the results obtained from the poult necropsy; and (3) the estimated 12 per cent cut-back in the 1953 turkey population contributed somewhat in this reduction.

Thirty species of Salmonella were identified serologically from 241 isolations recovered from 1,148 turkeys submitted in 1952. Of the Salmonella recovered, 32.7 per cent were *S. typhimurium* and this organism was responsible for 46.5 per cent of the uncomplicated paratyphoid outbreaks.

Of the total cases in which a paratyphoid organism was isolated, 54.0 per cent were classified as uncomplicated paratyphoid outbreaks.

Terramycin® and chlortetracycline (aureomycin) were the drugs of choice in controlling salmonellosis in turkey poults.

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Dieldrin for Maggot Control in Sheep

In field trials which involved nearly 30,000 sheep, dieldrin was found to be remarkably persistent in the fleece and to have outstanding larvicidal properties. When dipped either in an emulsion or a water suspension of 0.05 per cent dieldrin, sheep were protected against body strike for twelve to sixteen weeks and against crutch strike with the larva of *Lucilia sericata* for eight to ten weeks. Higher concentrations were not shown to be more efficient.—*Vet. Rec., March 27, 1954.*

A Liver Degeneration of Unknown Origin in Chickens

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DURING THE PAST few years, a noticeable increase in pathological changes in the liver has been evident in chicken specimens received for postmortem examination. One entity in particular was observed quite often, and an attempt was made to learn more about it. Routine examinations were made on all birds presented for necropsy. Tissues were taken from recently killed specimens from 20 different farms for histological examination. These were fixed in Bouin's fluid and stained with Harris's hematoxylin and eosin.

The condition was first reported in 1933 by Beaudette and Hudson[1] as "red flecks in the liver." Two cases were observed that year. No increase in the incidence of the degeneration was observed until 1949, when at least 26 of 83 cases with liver degeneration were reported as "red flecks." In 1952, 72 of the 110 cases with liver involvement were included in the "red fleck" category, and in 1953 nearly all were thus classified. The 191 cases reported in 1953 were distributed as follows: January, 20; February, 29; March, 20; April, 16; May, 11; June, 17; July, 5; August, 17; September, 8; October, 8; November, 16, and December, 24. Part of the incidence rise may be attributed to an increase in the necropsies, part to an increased interest in this disease process.

This liver degeneration has not been observed in birds under 8 weeks of age. It has been found only in single-comb white Leghorns, probably because of the predominance of this breed in the state. The condition is well distributed throughout the state, since only six counties failed to present cases.

The case history often includes reference to a persistent mortality of 1 to 5 birds per day over a period of several weeks. Such losses sometimes continue several months but generally persist for only two to four weeks, with the over-all mortality occasionally reaching 40 per cent. It is most frequent in pullets of laying age, but hens and cockerels may be affected.

The degeneration does not appear to be related to the feed, having been observed in birds fed by many different methods and on different types of mash. One pen of pullets may exhibit the characteristic, lowered egg production, cyanosis, droopiness, and mortality, whereas an adjacent pen fed the same ration shows no evidence of trouble. Birds of different strains of breeding on the same farm may be afflicted at the same time with no apparent relationship to management or feed. No treatment appears to be of benefit. Recovery occurs in time even without change in management. Several farms have reported this trouble over a period of several years.

Routine necropsies periodically reveal unsuspected cases, about 40 per cent, in 1953, being found when birds were examined for some other reason. The most striking feature of the disease is the gross pathological changes in the liver. Most livers are mottled and injected, with the color varying from a light yellowish brown to a deep reddish black. Some present diffuse stellate white flecks or small necrotic foci, while others bear irregular hemorrhagic blotches or circumscribed spots. The liver tissue is usually friable. Pools of uncoagulated blood may be present beneath the liver capsule as small discrete hemorrhagic foci or as large hematomas which frequently rupture, resulting in uncontrolled hemorrhage. The kidneys usually appear swollen and injected but exhibit no characteristic pathology. The spleen is likewise often mildly swollen and dark in color. No other constant changes have been observed.

Beaudette and Hudson,[1] using aerobic and anaerobic cultures, were unable to demonstrate a bacterial agent as a cause of the disease. They were also unable to reproduce the disease by direct inoculation with affected liver tissue. The inoculation of embryonating eggs with ground tissue

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For their contributions to the histological study, grateful acknowledgement is made to Drs. S. A. Goldberg, J. T. McGrath, and E. L. Stubbs.

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suspensions also failed to reveal an etiological agent.

HISTOPATHOLOGY

Minor differences are evident but, in general, the histological changes are similar. They may be classified as acute and subacute.

In acute processes, gross hemorrhage in the liver is prominent. Hemorrhages may be found beneath the liver capsule or in the liver substance. Marked congestion of the sinusoids is usually present. Lymphocytic infiltration occurs around the central veins and particularly in the vicinity of intralobular veins. Eosinophils are frequently found diffusely scattered or in clumps throughout the tissues. Heterophils are seldom found in numbers, but occasionally aggregates may be observed in the sinusoids or in the blood vessels.

Widespread liver necrosis or necrobiosis is common, the cells adjacent to the portal vessels often being least affected. Generalized or localized cloudy swelling and fatty metamorphosis is usually observed. The pathological changes appear to start with degenerate patches which have no relation to the structure of the lobule.

In subacute processes, focal areas of hemorrhage are often present, together with generalized congestion of liver tissue. Hemorrhages, bile pigments, and hemosiderin deposits are frequently found within necrotic liver foci. Intact erythrocytes found in these hemorrhages appear as relatively normal adult cells. Lymphocytic cuffing of portal vessels, as well as diffuse or focal infiltration of necrotic areas with lymphocytes, is common. These cells may be largely replaced by prominent masses of adult or immature eosinophil myelocytes.

Heterophils are generally present within or adjacent to necrotic foci, and in some sections they are numerous. Macrophages are also observed, particularly in granulomatous areas. Liver cords may present no visible outline, only ghost nuclei remaining. In other instances, only vacuolated cells may remain, and the central veins are often not evident. Focal necrosis which bears no relationship to lobular structure is common. Granulomatous areas with central fibrinoid necrosis, together with some hyaline degeneration, may be observed. Lymphocytes, heterophils, and macrophages are usually associated with these areas. Other areas may be observed in which no identifiable structure may be found, the degenerate reticular stroma being intermixed with acidophilic cytoplasm and broken cells.

SUMMARY

A liver degeneration of unknown etiology has been observed in chickens over a period of twenty years. The incidence has greatly increased and is associated with considerable mortality in some flocks. The histological findings of several cases are reported.

Research on Air Sac Infection

At a recent meeting in Washington, representatives from 11 states agreed on the following: (1) The best approach to the control of air sac infection in poultry is through improved management practices and the prevention of certain other poultry infections; (2) while some antibiotics inhibit the growth of the causative pleuropneumonia-like organism, when cultivated in live chicken embyros, they have not proved uniformly successful therapeutically; (3) the PPLO's found in air sac infection, chronic respiratory disease, and turkey sinusitis are indistinguishable; (4) air sac infection is more severe when complicated with Newcastle disease, infectious bronchitis, coccidiosis, coliform bacteria, or when poor poultry management practices are used; (5) diagnostic techniques such as blood tests, culturing the organisms, and microscopic pathology are only in the developmental stage; and (6) disease can be transmitted through the egg, having been diagnosed in day-old chicks.—*U.S.D.A. Release, May 6,1954.*

Effect of Caponizing on Newcastle Disease Immunity

Eighteen days after 30 cockerels were immunized against Newcastle disease, 10 were caponized by surgery and 10 by stilbestrol implantation. In another thirty days, the 30 cockerels and 5 unvaccinated controls were inoculated with virulent virus. The 10 vaccinated noncaponized birds and 7 from each of the caponized groups survived, while 3 from each of the caponized groups and all 5 unvaccinated birds died from Newcastle disease.—*Vet. Bull., March, 1954.*

Use of Dibenzylethylenediamine Dipenicillin G and Dihydrostreptomycin Sulfate in Chronic Respiratory Disease of Chickens

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"AIR SAC infection" is a term that is now used to describe almost any respiratory disease of poultry. Since the air sacs may be involved in many diseases, the term is an indefinite one.

True air sac infection, or chronic respiratory disease (CRD), is caused by an agent related to the filterable viruses and is commonly referred to as a "pleuropneumonia-like organism." Turkey sinusitis is thought to be caused by this same organism,[1,2] against which the value of streptomycin has been well established.[3-7] In flocks that appear normal, an outbreak of CRD may occur as a secondary infection of another disease or condition,[8,9] such as Newcastle disease, infectious bronchitis, or coccidiosis, or any unfavorable environmental factor that lowers the birds' general resistance. Live virus vaccinations against both Newcastle disease and infectious bronchitis have been suspected as fulminants.

During the past several years, CRD, particularly of young chickens, has been occurring with increasing frequency. It has become a major economic problem, especially among broiler raisers. While the initial morbidity is relatively low, the affected birds "rattle," sneeze, and appear droopy, sometimes gathering in huddles. A drop in feed consumption results in weight loss and, in layers, reduction in egg production. More commonly, the disease attacks birds from 6 to 8 weeks of age, killing 10 to 30 per cent and leaving a high percentage of culls. This disease entity has already been described in great detail by other authors.[8-10]

Because of the antibacterial spectrum of penicillin and because of the synergism[11-13] between penicillin and and streptomycin, it was thought that a combination might result in more satisfactory response in this persistent and progressive type of mixed infection[8,9] associated with a primary filterable infectious agent in naturally occurring outbreaks.

Due to the slow absorption rate when administered in aqueous suspension, N,N' dibenzylethylenediamine dipenicillin G was selected as the penicillin compound of choice for this type of treatment. It was combined with dihydrostreptomycin sulfate in the proportion to make a final suspension containing 50 mg. dihydrostreptomycin base, as sulfate, and 10,000 units of dibenzylethylenediamine dipenicillin G in each milliliter.

Typical field outbreaks in all stages of CRD were selected on the basis of flock history, symptoms, and postmortem lesions. In many cases, a definite diagnosis was made by demonstrating the disease agent in turkey poult sinuses and embryonating chicken eggs.

In most of the flocks treated, each bird in one group was given 0.5 to 1.0 ml. of the antibiotic suspension, depending on weight. Another group was chosen arbitrarily to serve as untreated controls. No other disease control measures, such as cleaning, disinfecting, etc., were instituted. The antibiotic suspension was administered intramuscularly in either the breast or thigh muscles by means of a multiple-dose, 2-ml., Cornwall syringe and a ⅝-inch, 20-gauge hypodermic needle. In all cases reported, the disease was well established and had progressed to the extent that pathological lesions were typical.

RESULTS

Table 1 summarizes the results obtained following the use of a suspension of dibenzylethylenediamine dipenicillin G and dihydrostreptomycin sulfate* on nine flocks. In flocks 5 and 7, controls were not maintained because the owners were hesitant about leaving untreated birds in a group of this size and economic value. However, in these flocks, as well as in the others, a comparison prior to, and following, treatment revealed a marked reduction in mortality, an increase in feed consumption, and a general improvement in the treated birds with respect to respiratory symptoms.

In those flocks in which the treated and control birds were kept separate until marketing, the owners reported a slight improvement in feed conversion and fewer condemnations at slaughter in the treated birds.

The method of handling one flock housed

Dr. Schmittle carried out these experiments while assistant professor of veterinary pathology and parasitology, University of Georgia, Athens, before accepting his present position at Michigan State College, East Lansing.

The author gratefully acknowledges the technical assistance given in this project by Mrs. Bennie Taff, Mrs. Kay Dembnicki, Mr. Frank Craig, and many of the veterinary students of the University of Georgia.

This work was supported in part by a research grant contributed by Wyeth Laboratories, Philadelphia, Pa.

*Bicillin®-SM was supplied by Wyeth Laboratories, Philadelphia, Pa.

TABLE I—Results Obtained Following the Use of a Suspension of Dibenzylethylenediamine Dipenicillin G and Dihydrostreptomycin Sulfate on Nine flocks

Flock	Age in weeks	No. treated	No. controls	Diagnoses	Results			
					Allay respiratory symptoms	Increase feed consumption	Mortality during 1 to 2 week post-treatment observation period	
							Treated	Controls
1	7	2,300	9,700	CRD and histomoniasis	Yes	Yes	Continued due to hist.	30/day
2	8	2,300	6,700	CRD and inf. bronchitis	Yes	Yes	3	136
3	9	4,500	2,200	CRD and inf. bronchitis	Yes	Yes	173*	73
4	8	10,500	10,500	CRD, inf. bronchitis, and hemorrhagic dis.	Yes	Yes	604**	755
5	11	900	none	CRD	Yes	Yes	none	Prior to treatment, 2 to 3 a day
6	9	3,000	4,000	CRD and hemorrhagic dis.	Yes	Yes	3	19
7	17	625	none	CRD and hemorrhagic dis.	Yes	Yes	none	Prior to treatment, 2 to 3 a day
8	10	2,000	5,000	CRD, histomoniasis, and hemorrhagic dis.	Yes	Yes	8	38
9	17	4,050	4,050	CRD and inf. bronchitis	Yes	Yes	9	37

*Excessive mortality in the treated group is explained by the fact that an unintentional selection took place in that all birds were in one pen, and the flock was divided during treatment by catching small groups. The healthy, more vigorous birds escaped treatment and remained in the control group. The over-all flock mortality decreased considerably.

**Sixty-five of these birds were lost during treatment.

in a single pen resulted in an unintentional selection of birds for treatment. This single, large pen was divided into two sections and all birds were crowded into one section. Half of the birds were then caught, treated, and dropped over into the other pen. As a result, the birds receiving treatment were the ones more easily caught, leaving the more vigorous birds in the control pen. Thus, there was a noticeable over-all flock improvement.

DISCUSSION

In a project of this type, in which a large portion of the work is conducted in the field, the administration of the drugs to the flock under the constant supervision of the investigator is less subject to error and interpretation than if the medication is left with the flock owner along with instructions about how to set up controls. The tendency of the poultryman, when his flock is sick, is to put the medication before the controls after a day or two of treatment. The net result is a testimonial based somewhat on the gratitude of the poultryman. It is partly for this reason that many of the so-called treatments for CRD have gained in popularity, especially those administered in the feed and water.

SUMMARY

The intramuscular administration of 0.5 to 1.0 ml. of a suspension containing, in each milliliter, 10,000 units of dibenzylethylenediamine dipenicillin G and 50 mg. dihydrostreptomycin base, as sulfate, produced favorable results in the treatment of chronic respiratory disease of chickens. There was a reduction in mortality, and feed consumption was resumed. There was a tendency toward general improvement of the flocks and a reduction in the number of culls. In broilers, the number of condemnations at slaughter was reduced.

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Rabies in a Native Carabao

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A ferocious native dog bit a pig and 2 native carabaos on the night of Feb. 2, 1954. This dog also attacked a woman and tore her coat. The pig was immediately sold for meat. The next morning, the dog was found dead beside an 8-year-old castrated carabao (fig. 1) with its intestines prolapsed from a gored wound of the left abdominal wall. This carabao had been bitten at the superior commissure of the left nostril.

The carabao was brought to the hospital of the College of Veterinary Medicine, University of the Philippines, on February 3 for examination and treatment. Tincture of iodine was applied on the deep lacerated wound of the nostril and 250 cc. of rabies vaccine from the Philippine Bureau of Animal Industry, with a concentration of 5.0 per cent brain tissue in 0.5 per cent phenol, was given. The dog was suspected of being rabid so its head was submitted for examination that same afternoon. The carabao was given 50 cc. of this vaccine subcutaneously the next day. On February 5, Negri bodies were found in the dog's brain. The carabao was, therefore, given 50 cc. of this vaccine subcutaneously, distributed at the left and right axillary region and forearm, on February 6, 8, 10, and 12, and the wound was painted with tincture of iodine each time. The wound was healed by February 13 and 155 days after being bitten, this carabao was still healthy and was used for work.

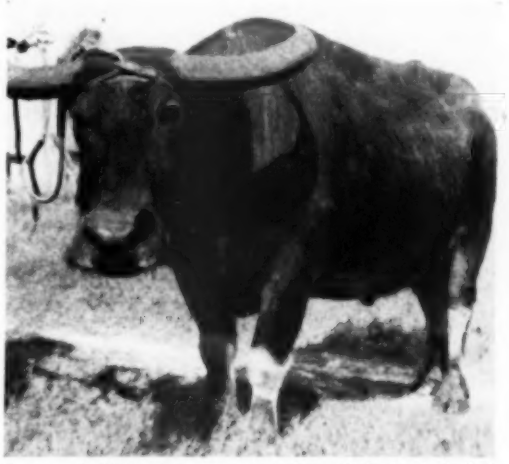

Fig. 1—A Philippine native carabao (Bubalus bubalis), bitten by a rabid dog at the superior commissure of the left nostril (indicated by circle).

The second carabao (fig. 2) was presented at the college hospital about 5:00 p.m. on March 3. This carabao also had been bitten on the nostril on February 2, by the same rabid dog, but the owner had rejected advice for wound treatment and rabies vaccination. The animal belched frequently, moved its tail continuously, and

Fig. 2—This carabao was bitten by a rabid dog at the lower wing of the left nostril. It died a few seconds after this picture was taken, thirty days after it was bitten.
(The right wing of the new building of the College of Veterinary Medicine, University of the Philippines, is in the background.)

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was showing stiffness of the hind quarters, grinding of the teeth, and symptoms of tympany. When presented again the following morning at 9:20 a.m., 500 cc. of the local brain tissue rabies vaccine was prescribed. It then, for twenty-four hours, had been continuously bellowing with a hoarse sound, restless, not eating, ramming its head violently against trees; it also had constipation, tympany, scanty urination, suspended rumination, eructation, grinding of the teeth, and increased salivation. Suddenly, this animal trembled, fell down paralyzed, and died at 9:30 a.m. The temperature was taken immediately and found to be 41 C. (105.8 F.). The incubation period had been thirty days, and death occurred one day after the owner noticed the symptoms.

The brain was removed and examined. There was hyperemia of the meninges and marked congestion of the brain but Negri bodies were not found. However, the history of a bite of a positive rabid dog and the clinical symptoms of this carabao were pathognomonic of rabies. This finding agrees with Merchant,[1] who states that some rare strains of the rabies virus do not form Negri bodies in the brain, especially in horses and cows where the presence of Negri bodies are not consistently found.

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Clinical Report of a Brain Abscess in a Gilt

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Sporadic cases of encephalitis are often a problem for the veterinarian, a complete diagnosis usually being difficult. This case, in a 9 month old, bred gilt, was interesting from the point of view of history, clinical symptoms, and difficulty of differential diagnosis.

Five days prior to the onset of symptoms, this gilt and 11 of her pen mates had been restrained in a stanchion crate and snubbed with a nose chain for routine otoscope examination of the nares, bleeding from the jugular vein, and collection of a vaginal swab. It was believed possible that her condition could have been due to some injury incurred in this process.

On Dec. 22, 1953, she did not eat and acted strangely. She backed away when approached and had a tendency to fall down when walking. Salt poisoning was considered but there was no possibility of this pen of animals having had access to an excessive amount of salt, and none of the pen mates developed symptoms.

When the gilt was first examined by the attending veterinarian, the signs observed were: temperature 104.8 F.; lungs clear; partial blindness, but the eyes looked normal on close examination; a tendency to back up and sag to the ground after a few steps; ataxia; and a tendency to circle. A tentative diagnosis of encephalitis of unknown etiology was made. Penicillin was administered intramuscularly and the gilt was put in an isolation pen in the swine barn.

Twenty-four hours later, the gilt was down, struggling and "bicycling." She was destroyed and necropsy revealed the following: Gross lesions of the digestive tract were confined to the gastric mucosa, which showed hyperemia. The meninges were normal but both hemispheres of the cerebrum were hyperemic, and an abscess about 15 mm. in diameter was found on the ventral surface of the brain. When the rather thick abscess capsule was incised, a creamy material was expressed. Culture of the material in the abscess revealed a species of Corynebacterium which possessed the characteristics of *Corynebacterium pyogenes*. Culture of the tissues taken from the other parts of the brain were negative for pathogens.

This case was diagnosed as a brain abscess with signs of encephalitis. Many lesions in the lymph nodes of the heads of slaughtered animals also yield Corynebacterium organisms.

From the Department of Veterinary Science, Ohio Agricultural Experiment Station, Wooster.

Rabies Vaccination Paralysis.—Observations were made in Europe in 1951 on about 30,000 dogs vaccinated with a formalin-killed adsorbate rabies vaccine. None of these dogs developed rabies, but when horse brain vaccine was used ten times as many developed a postvaccinal paralysis as when dog brain vaccine was used. This supports the allergy hypothesis.—*Vet. Bull., April, 1954.*

Atrophic Rhinitis. IV. Nasal Examination for *Pasteurella Multocida* in Two Swine Herds Affected with Atrophic Rhinitis

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Washington, D. C.

JONES[1] OBSERVED that *Pasteurella multocida* was rarely absent from early lesions of atrophic rhinitis; however, he did not influence the incidence of rhinitis in suckling pigs from swine herds affected with atrophic rhinitis by vaccinating them against Pasteurella.

Gwatkin, Dzenis, and Byrne[2] stated that they were able to produce atrophic rhinitis in rabbits and baby pigs by the instillation of live cultures of *P. multocida* in the nasal passages. In a later paper, Gwatkin and Dzenis[3] reported the isolation of *P. multocida* from 6 field cases of atrophic rhinitis. After nasal instillations were made with these cultures in baby pigs, atrophic rhinitis was observed.

Flatla and Braend[4] observed the characteristic atrophy of the turbinates usually seen in spontaneous cases of infectious atrophic rhinitis following intranasal instillations of *P. multocida*. McKay and Carter[5] were able to isolate *P. multocida* consistently from rabbits that had been inoculated with nasal material from swine affected with atrophic rhinitis; but in two trials involving 13 pigs, they were unsuccessful in attempts to produce rhinitis with pure cultures of the organisms.

Shuman *et al.*[6] made bacteriological examinations of 55 pigs. *Pasteurella multocida* was isolated from 13 pigs, 5 of which had atrophic rhinitis, 6 were normal, and 2 questionable.

MATERIALS AND METHODS

The relation of natural occurrence of *P. multocida* in the nasal cavities to lesions of atrophic rhinitis was studied in 172 swine from two rhinitis-affected herds. Seventeen weanlings in herd 1 were examined for lesions of the disease with the aid of a rhinoscope. At the same time, physiological saline washings of the nasal mucosa of each pig were collected. These washings were centrifuged and the sediment of each was inoculated into a tube of serum broth. After the broth cultures had incubated for eight to twenty-four hours at 37 C., they were streaked on dextrose starch (Difco) or serum-agar plates. The plates were incubated for twenty-four hours at 37 C. and examined with the stereomicroscope for the presence of *P. multocida* colonies.

Eleven adult hogs and 82 slaughter pigs from herd 1 and 62 slaughter pigs from herd 2 were examined and cultured immediately after slaughter. The nasal cavities of each animal were exposed by making two transverse cuts with a meat saw, one at the level of the canine teeth and one in line with the inner canthi of the eyes. After examinations for lesions of atrophic rhinitis, materials were obtained for culture by swabbing the nasal mucosa of the dorsal meatuses with sterile, cotton-tipped applicators. Each swab was inoculated into a tube of serum broth; these cultures were then handled as described above for cultures from living pigs.

From the Animal Disease and Parasite Research Branch, Agriculture Research Service, U. S. Department of Agriculture, Washington, D.C.

RESULTS

Pasteurella multocida was recovered from 10 of the 172 swine examined. The relationship of these recoveries to the incidence of atrophic rhinitis in swine is summarized in table 1.

TABLE 1—Relationship Between Pasteurella Multocida Isolations and Atrophic Rhinitis in Swine

Swine	No. swine examined	No. P. multocida isolations: Rhinitis-pos.	Rhinitis-neg.
	Herd 1		
Weanling	17	.....	0/17
Slaughter	82*	2/46	4/34
Adult	11	2/11	.....
	Herd 2		
Slaughter	62	2/19	0/43
Total	172*	6/76	4/94
Percentage of isolations		8.0	4.3

*The diagnosis of rhinitis was questionable on 2 pigs from which no P. multocida was isolated.

The ten strains of *P. multocida* isolated showed the following characteristics:

When these strains were grown on dextrose starch-agar for twenty-four hours, the colonies were translucent and mucoid with a strong tendency to coalesce; the average diameter was 1.5 to 2.0 mm.; the margin was round and even; the surface was smooth, convex, and glistening. When the colonies were observed through a stereomicroscope using oblique lighting, they were fluorescent. The organisms gravitated to the bottom of agar slants, and they grew as a uniform turbidity in broth. A stable suspension was produced in physiological salt solution which was highly resistant to settling out when centrifuged.

Organisms from the fluorescent mucoid

colonies did not agglutinate in *P. multocida*-immune serums, but they did produce agglutinins when injected into chickens. Five of the strains dissociated from fluorescent mucoid to blue-type colonies after they were carried on laboratory mediums. A strong agglutination reaction was produced when the fluorescent mucoid-type immune serums were mixed with organisms from the blue-type colonies.

The cells were nonmotile, nonspore-forming, gram-negative rods with average measurements of 1.2 by 0.57 μ. A large capsule was demonstrated with the indirect India ink and Congo red methods of staining. A few of the cells in a microscopic field showed a slight tendency to bipolar staining.

Acid, but no gas, was produced in dextrose, sucrose, mannitol, sorbitol, galactose, inulin, mannose, and levulose; no acid was produced in lactose, maltose, trehalose, dextrin, salicin, raffinose, rhamnose, and inositol; acid production was questionable in dulcitol, arabinose, and xylose; litmus milk remained unchanged; gelatin was not digested; indole and catalase were produced; urea was not hydrolized; nitrates were reduced to nitrites; methylene blue was reduced; and no growth was observed in M.R.-V.P. (Difco) medium. Hydrogen sulfide was not detected when strips of filter paper impregnated with lead acetate were suspended above serum-broth cultures. In addition to the above fermentations, one strain, which was strongly acidogenic, produced acid in arabinose, dulcitol, xylose, trehalose, and a slight amount in lactose; it also produced hydrogen sulfide.

SUMMARY

Bacteriological examinations were made on 172 swine, 76 of which were rhinitis-positive, 94 rhinitis-negative, and 2 questionable. *Pasteurella multocida* was isolated from 6 (8.0%) of the rhinitis-positive, and 4 (4.3%) of the rhinitis-negative swine.

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New Treatment for Bovine Rectal, Vaginal, and Uterine Prolapses

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In recent years, we have treated preparturient vaginal, or vaginal and rectal, prolapses in about 20 cows of both the beef and dairy types, sometimes as early as the fifth month of gestation.

Vaginal Prolapses.—These eversions are accompanied by severe abdominal pressing or tenesmus. The cow usually shows reduced needle-prick reflexes on the dorsal and dorsolateral parts of the body, the reflexes increasing anteroventrally but still usually being subnormal.

A change in therapeutic approach in the past three years has brought more satisfactory results than any method previously used. Tenesmus is reduced by the intravenous injection of 150 to 350 cc., or even 500 cc., of a commercial calcium, magnesium, phosphorus solution which is given slowly while the heart action is checked. When tenesmus has ceased, the organ, or organs, are properly prepared and the prolapse is reduced. Epidural anesthesia was also used in 1 animal which did not respond to calcium treatment. I have not used any vulvar sutures with this system of treatment.

The majority of these eversions do not recur but when they do, the treatment is repeated. Bedding may be built up under the hind limbs and kept that way for a short time.

To 1 cow, we administered 500 cc. of a calcium gluconate (only) solution. The tenesmus was reduced but this treatment proved to be less effective.

Prolapse of the Uterus.—On a few occa-

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sions when, shortly after parturition, cows have shown tenesmus with a threatened eversion and prolapse of the uterus, the same calcium compound solution given intravenously has checked the pressing, and prolapse did not occur. When the uterus has everted and when conditions make it possible, a block and tackle is used to suspend the cow by her rear limbs, the uterus being supported in a large pan while it is prepared and the fetal membranes removed; then it is replaced manually with only a reasonable amount of effort in most cases. In one case, it was necessary to administer the calcium solution intravenously to check the tenesmus before it was possible to reduce the uterine prolapse manually.

Usually, after manual reduction of the uterus, the calcium compound solution is given intravenously until tenesmus has diminished or ceased, until the cow is less restless, and until her reflexes improve. It is important to administer the solution slowly while studying the heart action, the dosage required usually being 150 to 350 cc. but sometimes as much as 500 cc. The patient is then lowered onto deep bedding which is arranged to support her rear quarters at a higher level than the forequarters. When the cow stands up, the position of the uterus is rechecked and a uterine antiseptic is inserted. The vulva is not sutured and epidural anesthesia is not routinely used.

On one occasion, the calcium therapy was given before the prolapse was reduced, in order to observe the reaction of the uterus. A noticeable contraction of the organ occurred promptly. As a result, reduction of the contracted organ, while presenting no serious difficulty, did require a little more effort than usual.

In a few recent cases, the pituitary oxytocic principle has been used but its value has not been evident.

In 1 treated cow in which the uterus had everted immediately after parturition, the calcium therapy seemed to check tenesmus for two days, after which the eversion recurred. Each repeated calcium treatment was less effective and for a shorter time. The cow died on the seventh day after receiving more than 5,350 cc. of the calcium solution. Other therapy tried on this cow included epidural injections of either procaine hydrochloride solution or of grain alcohol, magnesium sulfate solution intravenously, and a rope truss. None effectively reduced the tenesmus, although the magnesium solution seemed to be of some temporary benefit.

Thus, a solution of calcium gluconate, magnesium, and phosphorus in 150- to 500-cc. doses intravenously has usually effectively controlled the tenesmus associated with bovine rectal, vaginal, and uterine prolapses and is considered as beneficial therapy.

Rectal Prolapse in a Bull Calf.—A 6-month-old Aberdeen Angus bull calf with a nervous temperament was found exhibiting tenesmus and with its everted rectum protruding about 4 inches. This is not an infrequent occurrence in small bulls when they attempt to breed large cows. His limbs functioned well but the skin reflexes were gradually less responsive as tested progressively from the thoracic and lower abdominal regions toward the sacral and perineal regions.

After being restrained, the calf was given 100 cc. of the calcium solution intravenously. Tenesmus soon ceased and the prolapse was reduced. In thirty minutes, the tenesmus and the eversion recurred but when revisited three hours later, the reflexes still were improved. He was then given an additional 125 cc. of calcium solution intravenously, and the prolapse again was reduced. Normal micturition occurred in thirty minutes and the prolapse did not recur.

However, three months later, long after being castrated, the prolapse again recurred. When restrained, 200 cc. of the solution was given intravenously and, when tenesmus ceased, the prolapse was again reduced.

When old male dogs are presented for vaccination or other routine measures, it is well to check them rectally for signs of chronic prostatitis. Castration may retard its development.—*T. H. Brasmer, D.V.M., Illinois.*

The adiposogenital syndrome in dogs is primarily related to dysfunction of the hypothalamus. The important clinical signs are obesity, gonadal atrophy, hyperphagia, hypersomnia, polyuria, and polydipsia. On autopsy, a marked increase in subcutaneous fat and fat in other areas is noted.—*J. E. Martin, V. M. D., Pennsylvania.*

Magnamycin in Small Animal Practice

J. ANTELYES, D.V.M.*

Middle Village, New York

SINCE LITTLE mention of magnamycin[®]* can be found in veterinary literature at this writing, it may be of interest to report the results of its use in a series of 13 cases.

Magnamycin is a relatively new antibiotic, derived from the mold *Streptomyces halstedii*. Although not chemically related to any other antibiotic, it exhibits a spectrum of activity much like that of penicillin. It also shows activity against certain viruses and Rickettsia. Its main use in human medicine has been in cases of penicillin resistance and penicillin allergy.

CASE HISTORIES

The following 13 case histories describe our use of magnamycin in small animals.

Case 1.—A 3-month-old male Boxer was submitted in good condition except for a persistent, recurrent diarrhea of two weeks' duration. No intestinal parasites were found. The condition was diagnosed as enteritis. Common antidiarrheals failed to influence the character or frequency of the stools. After distemper-hepatitis serum was given every ten days for three weeks, a course of one 250-mg. magnamycin tablet every twelve hours for four days resulted in normal stools within twenty-four hours, and there was no recurrence in five months.

Case 2.—A 4-year-old male Doberman Pinscher, in good condition, had a temperature of 103.5 F., anorexia, conjunctivitis, marked rhinitis and coryza, moderate dyspnea, and cyanosis. His condition was diagnosed as coryza. Combined injectable penicillin and streptomycin therapy were ineffective, as was a course of oral terramycin.® When given a 250-mg. magnamycin tablet three times daily for six days, his temperature became normal and his appetite improved in four days, with recovery by the sixth day. There was no recurrence in four months.

Case 3.—A 3-month-old male Boxer had his ears cropped and had received distemper-hepatitis serum nine days previously. When submitted with a condition diagnosed as coryza, penicillin, cough medication, and terramycin failed to relieve his tonsillitis, coughing, and sneezing. His appetite was good and his temperature normal. When given a 250-mg. magnamycin tablet every twelve hours for four days, the symptoms soon disappeared, with no relapse in six months.

Case 4.—A 5-month-old male Beagle in fine condition had for two weeks developed watery stools late each day. This dog had been immunized against distemper and hepatitis when it was 3 months old. It had no parasites and had had no previous illnesses. The diagnosis was chronic enteritis. When there was no response to sulfaguanidine, opium, belladonna, bismuth, and kaolin, separately or in combinations, one 250-mg. magnamycin tablet three times daily for four days resulted in normal stools, and there was no recurrence in three months.

Case 5.—A 5-year-old female Dachshund, vaccinated for distemper in 1949, had an attack of acute tonsillitis and pharyngitis, which was easily controlled with penicillin and sulfonamides in 1951. In 1952, a similar attack was successfully treated with terramycin. In 1953, the dog was submitted with severe abdominal and lumbar pains, hyperesthesia, tonsillitis, ataxia, anorexia, dullness, and a staring attitude. Its temperature was 103 to 104 F. The condition was diagnosed as septicemia. After seventeen days of therapy with penicillin, streptomycin, terramycin, aureomycin, vitamins, liver, cortisone, and other drugs had failed, gradual improvement followed a course of one 250-mg. magnamycin tablet daily for one week after which recovery resulted with supportive treatment only.

Case 6.—An 11-year-old altered male cat, previously in good health, developed a temperature of 104 F., severe dyspnea, anorexia, cyanosis, coughing, a dull attitude, and harsh râles. The diagnosis was pneumonia. One 100-mg. magnamycin tablet three times a day for six days was followed by recovery and no relapse in five months.

Case 7.—A 6-year-old altered male cat, previously in good health, developed a tem-

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*Magnamycin (Chas. P. Pfizer & Co., Inc.) is the trade name for carbomycin.

perature of 105.5 F., dyspnea, coughing, sneezing, anorexia, marked pulmonary râles, and cyanosis. The diagnosis was pneumonia. One 100-mg. magnamycin tablet three times a day for twelve days was administered with vitamin B complex and liver injections daily. On the sixth day, the patient's temperature was 102.8 F., his appetite was slightly improved, and by the twelfth day, he appeared normal.

Case 8.—A 12-week-old female Boxer which had been given distemper-hepatitis serum at 9 and 11 weeks of age suddenly developed anorexia, tonsillitis, and dysphagia. The diagnosis was tonsillitis. During four days of terramycin therapy, her condition gradually worsened. When one 100-mg. magnamycin tablet was administered three times daily for six days, the dog recovered; there was no recurrence in three months.

Case 9.—A 5-month-old female Cocker Spaniel, with no previous illness, developed a temperature of 102.4 F., tonsillitis, coughing, anorexia, dysphagia, and gagging. The diagnosis was tonsillitis. After one 100-mg. magnamycin tablet three times daily for four days, the cough lessened and the appetite improved slightly but the temperture rose to 104 F. When given 250 mg. of terramycin twice daily for three days, the patient became normal with no recurrence in three months.

Case 10.—A 9-year-old female Terrier, discharged from a hospital two weeks previously after treatment for a virus infection, developed a temperature of 103 F., coughing, anorexia, dyspnea, tonsillitis, and intense scleral vascularization. After two weeks of antibiotics and supportive medication, the condition improved, then recurred with manifestations of hard pad disease. The animal did not respond to one 250-mg. tablet of magnamycin twice daily. Two days later, central nervous system disturbances occurred and euthanasia was performed.

Case 11.—A 5-year-old male Miniature Pinscher had for two days exhibited anorexia, vomiting, diarrhea, conjunctivitis, tonsillitis and pharyngitis; his temperature remained normal. The condition was diagnosed as a virus infection. He recovered after magnamycin therapy, one 100-mg. tablet three times daily for five days. There was no recurrence in three months.

Case 12.—A 10-month-old male Shetland Sheepdog, hospitalized for virus infection two weeks previously, developed a temperature of 103 F., tonsillitis, and gagging. The appetite was fair and the pads, slightly hard at first, became definitely hard later. Occasional mild convulsive spasms of the facial muscles and petit mal developed. Antibiotics, sedatives, rutin, and dilantin were ineffective. The diagnosis was hard pad disease. A course of one 250-mg. magnamycin tablet twice daily for nine days was accompanied by increasing nervous manifestations until dementia and opisthotonos occurred and euthanasia was performed.

Case 13.—A 5-year-old female Dachshund had delivered 1 pup on the sixty-fifth day of pregnancy. Later, she was in distress, straining, had a temperature 102.4 F., an odorus purulent vaginal discharge, and an empty, swollen, and sensitive uterus. The diagnosis was metritis. She was given one 100-mg. magnamycin tablet twice daily for five days and was completely normal by the third day, with no recurrence in five months.

DISCUSSION

Apparently, magnamycin succeeded in controlling infections which had been unsuccessfully treated with other antibiotics (cases 2, 3, 5, and 8). In addition, the drug seemed to exert activity against certain common canine and feline ailments.

In case 9, however, the infection seemed to be resistant to magnamycin but sensitive to terramycin.®

As expected, the hard pad syndrome was unaffected by magnamycin as by any other drug or treatment to date. No bacteriological identifications were attempted.

According to Tanner *et al.*[1] magnamycin was effective against gram-positive bacteria, "Rickettsia and the large viruses, such as Rocky Mountain spotted fever and psittacosis." Also, "of particular significance is the fact that some infections caused by streptococci and staphylococci resistant to other antibiotics have responded to this drug."

Hewitt and Wood[2] found magnamycin to be effective *in vitro* and *in vivo* against staphylococcic, streptococcic and enterococcic infections. They mention, however, that resistance may be produced readily and that gram-negative bacilli, yeasts, and fungi are refractory.

These reports suggest that some of the 13 cases described above may have been infected with gram-positive organisms, resistant to the common antibiotics, and sensitive to magnamycin.

CONCLUSIONS

1) Magnamycin® should certainly be given a trial in any infection which seems to be resistant to the common antibiotics.

2) Effective dosages in this series were 15 to 30 mg. per pound of body weight every twenty-four hours in divided doses administered orally as tablets.

3) No toxicity or harmful side-effects were observed.

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When the end of a cow's teat is badly traumatized or lacerated, clip off the injured portion, then keep it bandaged between milkings. A satisfactory sphincter will usually develop.—*R. D. Hoffman, V.M.D., Pennsylvania.*

Parturient Paresis Problem Cases

In recent years, an increased number of cows with parturient paresis, about 6 per year, have failed to make the expected recoveries following the usual intravenous therapy with commercial calcium compound solutions. These animals show some response but are unable to get up. They frequently rise partially on their hind limbs and then fall. This also occurs in some cows after a recovery and a relapse.

Therefore, some experimenting was indicated; after making sure that the cow could swallow, drenching with a mineral-yeast mixture* suspended in water was tried. In the first case, when about half a cup of the mineral was given twice daily, it took five days before recovery was complete. It may be a coincidence, but now when about 8 oz. of the mineral is given four times daily, the cows usually are up in twenty-four to thirty-six hours.—*R. O. Rydell, D.V.M., Wheaton, Minn.*

*Viaferm, Vitamineral Products Co., Peoria, Ill.

An Erysipelas Bacterin

A formalin-killed *Erysipelothrix rhusiopathiae* bacterin adsorbed with aluminum hydroxide was demonstrated in white mice to have a high activity potential. When tested on 183 turkey poults which were vaccinated intramuscularly with 1 ml. of bacterin, all survived challenge at three weeks while all of the 35 controls died. In another group, when 71 vaccinated poults were challenged intravenously three weeks after vaccination, 96 per cent survived while all of 8 controls died.—*Canad. J. Comp. Med. and Vet. Sci., March, 1954.*

Swine Practice Pointers

Erysipelas outbreaks have often followed, in a few days, the use of rabbit origin, hog cholera vaccine without serum on farms where erysipelas is prevalent. Serum should be used with the vaccine on these farms.

Hemorrhagic dysentery is treated with arsenical preparations (2.1 gr. of elemental arsenic to each gal. of drinking water) for six days.

Necrotic enteritis responds well to 2 oz. of sodium sulfathiazole in the drinking water (per 5,000 lb. of swine) each twenty-four hours for four days, then one-half of that dose for an additional three or four days. Severe cases should receive *per os* 37 gr. of the sulfonamide daily per 50-lb. pig, or 1 gr. per pound may be injected intraperitoneally.

Scirrhous cords, if treated early, respond to one or two doses of procaine penicillin in oil intramuscularly.—*John W. Carey, Iowa, in the Southwest Vet., Spring, 1954.*

Tenth Anniversary for Streptomycin

Streptomycin, the first chemotherapeutic agent to prove effective against tuberculosis, passed its tenth anniversary recently. Dr. S. A. Waksman of Rutgers University, one of the discoverers, states that, in ten years, streptomycin production has grown from a few grams to an industry consisting of nine manufacturers in the United States and 17 in foreign countries, exclusive of several behind the iron curtain. Meanwhile, the price has dropped from $25 per gram in 1946 to a bulk price of less than 25 cents per gram.—*TB Medical News, July, 1954.*

Bacterial Flora of the Canine Vaginal Secretion
A Preliminary Report

A. A. LEIBOLD, D.V.M.

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THE ANTERIOR portion of the healthy canine vaginal tract has usually been considered comparatively free of pathogenic bacteria. A bacteriological survey of the area at or near the os uteri of healthy dogs was undertaken, since no comprehensive reports on such work were found in literature. Specimens were obtained of secretions of the vaginal mucosa in the vicinity of the os uteri of apparently normal dogs admitted to the clinic of the School of Veterinary Medicine, Alabama Polytechnic Institute, during the summers of 1952 and 1953. These were made the subject of a bacteriological investigation that is the basis of this preliminary report.

LITERATURE CITED

Extensive surveys of the bacterial flora in the human vagina have been reported. Schaefer's[1] survey of the literature dealing with the human female led him to conclude, in 1917, that the "organisms of the basic flora of the vagina are all nonpathogenic. . . that pyogenic bacteria occur very rarely and only as a passing phase."

Miura[2] has shown that in the human subject ovariectomy and cessation of ovarian function, as at the menopause, result in an alkaline reaction of the vaginal secretion and a heterogeneous bacterial flora. He also showed that when the ovaries are actively functioning, glycogen occurs in the vaginal epithelium. Cruickshank and Baird[3] observed that during pregnancy in women the acidity of vaginal secretions increased markedly. Harada[4] stated that the acidity, which is due to lactic acid, many reach 0.9 per cent. Doederlein,[5] in 1892, reported finding a bacillus in the vaginal secretions of about 50 per cent of pregnant human patients, with practically no other organisms being present. This organism, known for many years as Doederlein's bacillus, was considered later by Thomas[6] as identical with *Lactobacillus acidophilus* (Moro). Doederlein attributed the bactericidal mechanism of the vaginal secretion in pregnancy to the acid produced during the growth of this bacillus in the secretion.

Cruickshank and Cruickshank,[7] in 1931, reported that the bacterial flora on the human vaginal mucosa showed variations depending upon the physiological state of the patient. It is possible that the bacterial flora in the vagina of dogs and other animals would vary for similar reasons.

This investigation was begun without regard to ovarian activity; although some dogs were in estrus, they nevertheless were examined. It was originally planned to search for streptococci only, but eventually other organisms were also recorded.

Various species of streptococci occurring in the female genital tract of dogs have been reported by Stafseth *et al.*[9] They proposed naming one encountered frequently *Streptococcus canis*. Several other authors[8,11,16] have reported streptococcic infections of various regions in dogs, but few dealt only with infections of the female genital tract. Jourdan and Hill[8] state that two kinds of organisms (hemolytic streptococci and *Escherichia coli)* are commonly isolated from vaginal swabs of normal animals (dogs).

Three general criteria for differentiating streptococci have been advocated by various workers,[13,14] *i.e.*, hemolytic reactions on blood-agar Petri plates, biochemical or physiological reactions, and immunoreactions (precipitin and agglutinin reactions). In this investigation, the hemolytic and biochemic or physiological reactions were used as bases for identification.

PROCEDURES FOR OBTAINING SPECIMENS

The lumen of the vaginal tract of the bitch is occluded to a great extent by the longitudinal folds of vaginal mucosa. This forms a barrier which makes it impossible to reach the os uteri with a swab without touching the walls of the vagina. To avoid this, two sizes of Killian metal nasal speculums, 3- and 3½-inch blades, and one size of Sims' metal rectal speculum, 6½-inch overall size, 3½-inch blades (both for human clinical work), were tried. However, the mucosa folds slipped between the specular blades, occluding the opened tract to such an extent that it was impossible to introduce a sterile cotton swab without it touching these folds. This was the case regardless of the size or age of the bitch or whether she was in a horizontal position or suspended by the hind legs.

Eventually, a double glass tube speculum was designed (fig. 1).* It consisted of a glass tube within which was a smaller glass tube containing a cotton swab on a wooden applicator. The anterior end of the outer tube was slightly flanged outward to divert accumulating mucous secretions

This paper was approved by the Committee on Publications, School of Veterinary Medicine, Alabama Polytechnic Institute, publication No. 413.

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*The author appreciates the timely cooperation given by Dr. J. E. Neal, assistant professor, Department of Bacteriology, which aided in the development of the speculum.

from the inner tube during the introduction of the apparatus. The assembled speculum was wrapped in paper and sterilized in an autoclave. After cleansing the vulva with a roccal solution (1 oz. roccal in 1 gal. 70% alcohol solution),

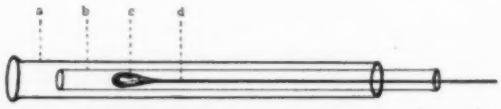

Fig. 1—Glass double-tube speculum: outer glass tube (a); inner glass tube (b); cotton swab (c); and wooden applicator (d).

the exterior of the outer tube was lubricated with pentacresol® jell and the apparatus introduced about three-fourths of the length of the vagina. The inner tube was then pushed forward until it protruded approximately ½ inch beyond the lip of the outer tube, thus avoiding the mucous secretion adhering to the flanged lip of the outer tube. Next, the sterile swab was pushed forward to contact the mucosa of the os uteri, then carefully withdrawn and placed in a culture tube containing sterile dextrose broth for later examination. The tubular speculum was then withdrawn from the vagina. Close examination of the apparatus, after it was withdrawn, in most instances did not reveal any adhering secretion that could have contaminated the swab. Occasionally, when the swab became contaminated, it was discarded and the operation was repeated. In most cases, the examinations were made under ordinary restraint, but exceptionally nervous animals were quieted by intramuscular injections of 75 to 100 mg. of demerol.®

In addition to examining normal bitches, a series of fresh uteri were obtained in 1952 from bitches that were spayed under aseptic conditions.* The outer surfaces of these uteri, just anterior to the cervix, were then seared with a hot spatula, incised with a sterile sharp-pointed scissors, and the exposed internal surface swabbed with a sterile swab. The adhering secretion thus obtained was then examined bacteriologically, but no organisms were found.

*The author is indebted to Drs. B. F. Hoerlein, professor, and E. M. Jordan, assistant professor, Department of Small Animal Surgery and Medicine, for supplying the aseptically removed uteri.

TABLE 1—Bacteriological Findings at the os Uteri and in Uteri of Normal Bitches (1952)

Clinic case No.	Age	Bacteria found
824	1 yr.	Unidentified streptococci and gram-negative rods.
782	9 mo.	Coliform organisms.
866	9 mo.	None.
908	3½ yr.	None.
943	4 yr.	Unidentified streptococci and gram-negative rods.
209	2 yr.	Streptococcus equisimilis.
372	5 yr.	Streptococcus canis.
653	1½ yr.	Streptococcus canis.

No bacteria were found on the endometrium of excised uteri obtained from 9 bitches that ranged in age from 6 months to 9½ years.

BACTERIOLOGICAL EXAMINATION OF SPECIMENS

The routine procedure included making streak inoculations with the secretion from the swabs on blood-agar plates for primary isolation of organisms and to ascertain their hemolytic reactions, if any. Smears of the same secretion were then stained by Gram's method. Criteria for identification of the isolated organisms were their biochemical or physiological activities according to Bergey's[17] 1948 classification and Merchant's[18] differentiation of animal streptococci.

DISCUSSION AND CONCLUSIONS

The healthy female dogs brought to the clinic consisted mostly of dogs to be

TABLE 2—Bacteriological Findings at os Uteri of Normal Bitches (1953)

Clinic case No.	Age	Bacteria found
49	5½ yr.	None.
356*	7 mo.	Unidentified nonlactose-fermenting, gram-negative rods.
417	1½ yr.	Unidentified nonlactose-fermenting, gram-negative rods.
429	3 yr.	Micrococcus epidermidis.
385*	2 yr.	Streptococcus equisimilis.
446	3 yr.	Unidentified nonlactose-fermenting, gram-negative rods.
544	14 mo.	Unidentified nonlactose-fermenting, gram-negative rods.
539	1½ yr.	Micrococcus epidermidis.
583	5 yr.	Micrococcus epidermidis.
592*	5½ yr.	Coliform organisms.
646	4 yr.	Unidentified nonlactose-fermenting, gram-negative rods.
653	2 yr.	Unidentified nonlactose-fermenting, gram-negative rods.
655	4 yr.	None.
693	1½ yr.	Streptococcus equisimilis.
704	4 yr.	Unidentified Streptococcus sp.
223*	1 yr.	Coliform organisms.
741*	2½ yr.	Streptococcus canis.
755	15 mo.	Unidentified nonlactose-fermenting, gram-negative rods.
756	old	Unidentified nonlactose-fermenting, gram-negative rods.
764	5 yr.	Streptococcus equisimilis.
680*	1½ yr.	Streptococcus canis.
766	5 mo.	Unidentified nonlactose-fermenting, gram-negative rods.
818	2 yr.	Unidentified nonlactose-fermenting, gram-negative rods.
824	1 yr.	Unidentified nonlactose-fermenting, gram-negative rods.
832*	3 yr.	Unidentified nonlactose-fermenting, gram-negative rods.
835*	7 mo.	Unidentified Micrococcus sp.
607*	15 mo.	Coliform organisms.
755	.....	Unidentified nonlactose-fermenting, gram-negative rods.

*In estrus.

boarded, bathed, or clipped; cases for minor surgery; and animals in estrus. All those suffering from infectious diseases or major surgery were excluded from this survey except the 9 cases of oophorohysterectomy, none of which showed any microorganisms upon culturing specimens of the secretion swabbed from the inner surface of the cervix.

The glass, double-tube speculum developed and described is practical and generally satisfactory for obtaining specimens of secretion from the region of the os uteri without contaminating the specimen through contact with other parts of the vaginal tract (table 1).

A total of 28 subjects was examined during two summer months of 1953 (table 2). Bacteria were found in all but two instances; the swabbings yielding a variety of bacteria, 8 of which could be identified as to species and 13 as to genus. Three isolates were coliform, six were streptococci, and four were micrococci. Thirteen of the 26 cultures were gram-negative rods morphologically resembling *coli-aerogenes* organisms but they would not ferment lactose. Further attempts at identification of these were delayed due to lack of time.

SUMMARY

The findings on the swabs from the os uteri of the 36 animals examined during 1952 and 1953, excluding the nine uteri which were obtained from spayed bitches, are as follows:

Streptococcus canis	4
Streptococcus equisimilis	4
Streptococcus sp.	1
Micrococcus epidermidis	3
Micrococcus sp.	1
Coliform	4
Nonlactose fermenting rods	13
No bacteria	4
Unidentified bacteria	2

Thus, 25 per cent of the dogs examined harbored at their os uteri species of streptococci that were probably dangerous, and approximately 11 per cent harbored micrococci.

It is planned to continue this investigation.

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Drams Not Ounces in Swine Dysentery.—In the quotation from Dr. T. L. Steenerson in the July, 1954, JOURNAL (p. 60), the second sentence should read: for pigs too sick to eat, 4 *drams* (not ounces) of sodium chloride plus 4 *drams* of sodium carbonate per 100 lb. of body weight should be given in a drench.

Some Relationships of the Gram Reaction to Bacterial Disease Processes

A Brief Review

JOHN W. OSEBOLD, D.V.M., Ph.D.

Davis, California

THE TECHNIQUE of Gram's staining is familiar to all veterinarians. Yet the relationship of the staining reaction to clinical aspects of bacterial diseases may not be fully appreciated. Gram's staining places bacteria into two large groups: gram-positive and gram-negative. Because this grouping has several features of medical significance, the mechanism of the gram reaction has been extensively investigated. The Gram's stain is an unusual differential stain since the ability to retain the dye is confined almost entirely to the true bacteria and yeasts. Gram-positive bacterial cells can, therefore, be demonstrated in mammalian histological sections.

Some differences in the two cell groups help to explain the variation in dye retention. The apparent isoelectric point of most gram-negative bacteria is above a pH of 4, and that of most gram-positive bacteria is below a pH of 2.[1] The gram-positive cells may be more acidic in property because of a greater abundance of dissociated phosphoric acid radicals in the nucleic acid constituents.[2] Magnesium ribonucleate has been removed from gram-positive cells, leaving a gram-negative skeleton. Under certain conditions, this material could be replated back onto the organism to render it gram-positive again.[3]

Since the nucleic acid complexes of gram-positive bacteria render the cells more strongly acidic, they are able to take up more basic dye and hold it more firmly than gram-negative cells. Gram-negative bacteria are also more permeable to dyes in the decolorizing agent so that the gram-negative substrate is more readily decolorized.[2]

These, then, are the basic chemical or physical differences recognized between the two cell groupings. Some differences in physiological behavior are associated with this staining reaction.

From the Department of Microbiology in the School of Veterinary Medicine, University of California, Davis.

DIFFERENCES IN PHYSIOLOGICAL BEHAVIOR

a) Bactericidal Serological Reactions.—The complement-fixation reaction demonstrates one difference between gram-positive and gram-negative organisms. When members of either cell group combine with specific antibody and complement is added, fixation of the complement may occur. However, in the case of gram-negative cells, the reaction may progress to the extent of killing and even lysing of the bacterial cells. This has been well demonstrated with *Vibrio comma* and *Salmonella typhosa*, both of which are gram-negative.[4] Gram-positive organisms are resistant to killing by this mechanism. The *in vitro* evidence would suggest that immune bactericidal and bacteriolytic phenomena may serve an important function in resistance to infection by gram-negative bacteria.

b) Spore Formation.—Typical endospores are formed only by gram-positive bacteria of the genera Bacillus and Clostridium.[5] The importance of gram-positive spore-formers such as *Bacillus anthracis, Clostridium tetani, Clostridium feseri, (chauvoei)*, and many others are well known in veterinary medicine and need not be described further here.

c) Penicillin Sensitivity.—Penicillin is almost exclusively active against gram-positive bacteria. The antibiotic impairs the ability of gram-positive cells to assimilate certain free amino acids.[6] Species unable to synthesize amino acids soon stop growing after the internal amino acid supply is depleted. Therefore, resistance to penicillin correlates with the nutritional independence of the bacterial cell. Pathogens susceptible to penicillin have poor synthetic ability and include such gram-positive genera as Clostridium, Staphylococcus, Streptococcus, and Erysipelothrix. Conversely, penicillin is ineffective against the more nutritionally independent Brucella and the enteric organisms which are gram-negative.[7]

d) Bacteriostatic Effect of Dyes.—Generally speaking, the gram-positive bacteria are much more susceptible to the bacteriostatic effect of such dyes as gentian violet than are the gram-negative forms.[5] It must be remembered that this is a matter of degree, however, and that dye concentration can be reached which will affect both groups. This may be associated with the apparent isoelectric points of bacteria, since more free acid groups on the gram-positive cells may more readily take up the basic dye. This dye effect is put to use by the clinician when he uses gentian violet on a superficial infection or infuses acriflavine as

was formerly done for streptococcic mastitis.[9] The bacteriologist uses this effect in selective mediums. When he is seeking a gram-negative organism in mixed cultures, a dye can be incorporated in the medium to suppress gram-positive bacteria.

e) Toxin Formation.—The gram reaction determines to some extent the type of toxic substances that may be expected from bacterial cells. Certain gram-positive organisms extrude protein materials that may be noxious to mammalian tissue components. These are called exotoxins, and they are responsible for the detrimental effects on the host in cases of tetanus, botulism, malignant edema, blackleg, enterotoxemia, etc. These exotoxins are composed of amino acids common to other proteins. None of these constituents is considered toxic in itself. The only explanation offered for the severe effect of these proteins lies in the spacial configuration of the amino acids comprising them.[10]

Other protein substances extruded from gram-positive cells may be enzymes that are not toxic in themselves but which, because of their action, may favor the development of the bacterial parasite in host tissues by opposing certain primary defenses of the body. Examples of this latter group are seen in the hyaluronidases produced by *Clostridium perfringens* and by certain streptococci, staphylococci,[11] and the Erysipelothrix organism.[12]

It has been suggested that certain arthritic processes may be due to changes in the cementing substances brought about by the hyaluronidases of microorganisms. We see this association in arthritis of foals caused by streptococci, in arthritis of turkeys caused by staphylococci, and in arthritis of sheep and swine due to *Erysipelothrix rhusiopathiae*.[12] The enzyme hyaluronidase may play a role in disseminating some strains of staphylococci that are prone to produce gangrene of the udder.

The hemolysins of *Cl. perfringens* (*theta* toxin) and *Cl. tetani* and streptolysin 0 of some streptococci all appear to be similar chemically and are probably enzymatic in action. They also seem capable of acting on cells other than erythrocytes; thus, their action on leukocytes has earned for them the name "leukocidins".[10] Another extracellular enzyme that participates in determining the fate of the invading bacterium is the penicillinase of some staphylococci which renders the microorganisms resistant to the action of that antibiotic.[13]

Clostridium perfringens produces two other extracellular enzymes of interest. One is collagenase, a protease that disintegrates muscle by decomposing the reticular scaffolding and seems to be responsible for the pulping up of muscle as seen in gas gangrene.[14] The other enzyme is lecithinase, the most powerful substance in *Cl. perfringens* type A. This is called *alpha* toxin. Some of it is contained in *Cl. perfringens* type D which is implicated in enterotoxemia of sheep.[15] This enzyme hydrolyzes lecithin and since the latter substance is such an important cell constituent throughout the tissues, the result is rapid lysis of red blood cells and necrosis of other types of cells.

While exotoxins are more usually obtained from gram-positive bacteria, there are also deleterious substances characteristically associated with gram-negative organisms. These are designated as endotoxins. They are intimately associated with the structural integrity of the cells and are not liberated into the medium unless autolysis has occurred. Chemically, endotoxins appear to be complexes composed of phospholipid, carbohydrate, and protein. Injection of these toxins results in fever, a sharp rise in blood sugar followed by hypoglycemia, a fall in inorganic phosphorus, and debility,[16] Endotoxins play an important role in the pathogenesis of such diseases as salmonellosis,[17] pasteurellosis,[18] plague,[19] and tularemia.[20]

All these infections are produced by gram-negative organisms which probably autolyze in great numbers within phagocytic cells, thus releasing endotoxins which may necrose the surrounding tissue and injure blood vessels. It is noteworthy that these noxious substances are produced by pathogenic and nonpathogenic gram-negative bacteria alike. This is demonstrated when the common associate, *Escherichia coli*, gains entrance to regions such as the urinary tract under circumstances which allow it to become established there. This organism, which is usually considered only a commensal in the digestive tract, can produce a severe clinical episode when it colonizes in an area where large amounts of endotoxins are absorbed.

The gram-negative endotoxins have further interest in clinical medicine since they may be responsible for pyrexial reactions following intravenous injections of saline,

glucose, or therapeutic serums. Care must be taken that solutions for intravenous injections are made from freshly distilled water so that no gram-negative organisms will have an opportunity to grow in them.[10]

CONCLUSION

These are, in brief, some of the ways in which the gram reaction is concerned with the behavior of pathogenic bacteria. Such information has been found valuable in teaching veterinary microbiology, since it introduces the student to the idea that infectious diseases are dynamic processes in which the host and parasite participate. An insight into the changes that may occur in the host from a given disease agent assists in the understanding of pathology because it obviates learning by the blind memorization of lesions. Furthermore, the information helps the graduate veterinarian to perceive what substances are used to make a given biological product and how to choose the correct items for a given need.

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Vaccination of Sheep with *Clostridium Perfringens* Type D Vaccines

(An Abstract)

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Vaccination of sheep against enterotoxemia with alum-precipitated formalized vaccine is widely practiced. However, troublesome local reactions have been consistently produced under field conditions, often resulting in "down-grading" at market. As it has been shown that aluminum adjuvants may increase local reaction considerably, studies to determine severity and frequency of such reactions were instituted, as well as the effects of omitting alum on the occurrence of reactions and immune response.

Twenty-four lambs, about 6 to 8 months old, were divided into 2 groups of 12 each. One group received 5 cc. of alum-precipitated vaccine and the second group received 5 cc. of vaccine without alum, subcutaneously, just back of the elbow. During a twenty-three day observation period, all lambs injected with alum-precipitated vaccine showed appreciable swelling, while 11 of the 12 injected with vaccine without alum showed negative or minimal reactions by the end of the observation period.

Effects of components and combinations of components of the vaccine on local reactions were then studied. The production culture medium was pre-

The original article will appear in the October, 1954, issue of the American Journal of Veterinary Research.

pared (sample 1). The medium was inoculated with *Clostridium perfringens* type D organisms and incubated. After the growth period, formalin was added (sample 2). Sample 2 was divided and half was alum-precipitated (sample 3). A part of the formalized whole culture was then centrifuged for one hour at 2,500 r.p.m. The supernatant was removed as toxoid (sample 4). Sample 4 was divided, and to half was added 0.75 per cent alum (sample 5). The sediment from centrifugation was washed several times with physiological saline and was resuspended to original volume with 0.75 per cent alum solution (sample 6). Sample 2, formalized whole culture, was assayed and found to contain 0.48 per cent formalin. Nonculture solutions in distilled water of 0.48 per cent formalin (sample 7) and 0.75 per cent alum (sample 8) were also used.

Each of 25 lambs was clipped on both flanks and sides, and 5 cc. of each of four different samples were injected subcutaneously on each side at marked sites located equidistant in a 6 by 8-in. area. Animals were observed daily for seventy-four days and severity of local reaction was determined by actual measurement. The frequency of occurrence was more notable than the extent of reaction. Reactions occurred as early as the first day, but no new reactions occurred after the eighth day. Usually, reactions began to subside about fifteen days postinoculation, and persisted for varying periods. Single components—complete medium, formalin, or alum—produced no measurable reactions. Samples of combined components containing alum caused a considerably greater number of reactions than those without alum.

Following these results, it was deemed advisable to study the effect of alum-precipitation and its omission on the intensity and duration of antitoxin response to vaccination. Half of a lot of formalized whole culture of *Cl. perfringens* type D vaccine, testing between two and three times higher than the minimum potency required, was alum-precipitated. Each of 10 lambs was injected, subcutaneously behind the right elbow, with 5 cc. of this preparation. Each of a second group of 10 lambs was injected in the same manner with 5 cc. of vaccine without alum, and a third group of 4 lambs was held as uninoculated controls. All lambs were bled before vaccination, and three, nine, fifteen, and eighteen weeks postvaccination, for determination of antitoxin titers. Lambs receiving vaccine without alum showed equally as high antitoxin levels as those receiving alum-precipitated vaccine, nor was there any difference observed in the maintenance of antitoxin levels. No measurable levels were noted in unvaccinated controls. Under the conditions of this test, it would appear that alum can be omitted from the vaccine without measurable effect on antitoxin response.

The results obtained in these experiments appear to indicate that omission of alum from *Cl. perfringens* type D vaccine would result in a more useful product from the standpoint of local, persisting reactions, and that durable immunity can be induced by such vaccines.

Salivation and Frothy Bloat

In sheep grazing on green lucerne, frothing of the ruminal ingesta was the main cause of bloat. It is believed that the froth forms when the ruminal ingesta is of a thick, tenacious consistency, that this consistency results from the lack of salivary secretion, and that coarse material in the rumen stimulates the secretion of saliva, thus preventing bloating.—*Vet. Bull., June, 1954.*

Potassium Penicillin—Not Procaine

In the article by Russo *et al.* on the comparison of penicillin given intramuscularly and orally in the April, 1954, JOURNAL (p. 284-289), the first sentence in the first paragraph on page 285 should read thus: Graph 1 illustrates both the average and individual concentrations of penicillin in the plasma of the same 3 female dogs (3-month interval between experiments) following the oral administration of 100,000 units of *potassium* penicillin G *and* 0.25 Gm. of benemid *versus* 100,000 units of crystalline *potassium* penicillin G intramuscularly and the oral ingestion of 0.25 Gm. of benemid.

Weeping Eczema in Young Pigs

For many years, weeping eczema or "greasy skin disease" in young pigs has been a serious problem in occasional herds. At first, the pigs are less alert and their skin collects dirt. When examined, the hair is matted with serum oozing from creased lines in the skin, first over the neck and shoulders, then, in severe cases, over the entire body and tail. There is a characteristic rancid odor. The loss of epidermis may be compared to that of a severe burn. Death soon follows. With all treatment seeming ineffective and the condition being nontransmissible, the possibility of its being an allergy was investigated. The only constant factor was found to be straw bedding. Losses stopped if the straw was removed. Scrubbing the pigs at that time with soap and water also seemed beneficial. Since straw is widely used without ill effects, it is possible that some fungus may be responsible.—*Corn States Needle, Spring, 1954.*

Feline Diseases

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WHEN ONE ATTEMPTS to produce a paper on the infectious diseases of the cat, he is impressed by the confusion of ideas and dearth of material on the subject. There is great need for organized investigation on ailments of the cat. At present, there are few specific disease entities native only to the cat. Some of the ones to be mentioned do not have a clearly defined causative agent, which probably means that they are viral in nature. Two of these diseases, *i.e.*, feline panleukopenia and feline pneumonitis, are the exception because their symptoms, causative agents, courses, and treatment have been studied extensively.

RARE DISEASES

Knowledge regarding three, and possibly four, of the other diseases is incomplete and confusing. These are diphtheritic laryngitis, contagious glossitis, chronic gingivitis, and possibly a type of pneumonia that may be transmissible to man. An anaplasmosis-like disease and icterus, or jaundice, in the cat have been reported.

Diphtheritic Laryngitis.—Smythe[1] and Winter[2] described what they called "infectious laryngo-enteritis" and reported finding several cases in England. Winter also quoted Krembs and Seifried[3] as having seen several cases in Germany. The disease is characterized by a catarrhal, diphtheritic laryngitis and tonsillitis with deposits of grayish white pseudomembranous exudate on the glottis and perilaryngeal tissue. No account of this disease was found in the American literature, and the author does not recall having seen a cat with such lesions.

Icterus.—In our practice, we have observed icterus in cats, usually in those that run free. The course of the disease is rapid and the main symptoms are dehydration, icterus, vomiting, debility, subnormal temperature, and rapid death. We have not made clinical studies on the disease nor do we find it reported in the literature. It has occurred often enough, however, that we consider it a disease entity. The general symptoms resemble the jaundice type of leptospirosis seen in the dog. More investigation is needed on this condition.

Contagious Ulcerative Glossitis.—Smythe[1] reported a disease which he called "contagious ulcerative glossitis." This condition occurs in mature animals. Drooling, wet chin, anorexia, and a foul mouth odor are the first symptoms observed. In the early stages no lesions may be found in the mouth; later the tip and edges of the tongue are inflamed and, as the case advances, ulcers up to 1 mm. in size appear on the dorsal surface. These may coalesce to form a large ulcer and, in extreme instances, the end of the tongue becomes necrotic and sloughs. Death seldom occurs, but the animal has difficulty eating and drinking and becomes dehydrated and emaciated. In America, this syndrome has been seen occasionally with its symptoms of foul breath, anorexia, glossal necrosis, and drooling. The course is usually ten to twelve days and, in our cases, there was little evidence of contagion.

Chronic Gingivitis.—Adult cats are occasionally seen with chronic gingivitis. The cause of this is not known, but most evidence suggests that a spirochete is responsible. Many times the condition advances so far that most or all of the teeth are lost. A direct application of a solution of penicillin has been effective against this infection but parenteral injections are not beneficial. In our experience, equal parts of aqueous suspension of penicillin procaine and Abbott's vi-daylin (vitamin supplement containing vitamins A, B, C, and D) make an excellent mixture. This is applied directly to the lesions three or four times daily with a medicine dropper. The response is usually dramatic.

Transmissible Pneumonia.—Blake, Howard, and Tatlock[4] reported a peculiar type of virus pneumonia in farm cats. All the cats, and four of eight members of the family, were affected. These investigators from the Yale Medical School thought that the primary atypical virus pneumonia suffered by members of the family was the same that caused the illness of the cats.

Presented at the annual meeting of the American Animal Hospital Association in Minneapolis, May 6-9, 1953.

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They reported this to be a different virus than the Baker[5] feline pneumonia virus. This virus would neither grow on eggs, infect mice, or produce elementary bodies. No new cases have been reported for ten years. Whether this actually was a different type of pneumonia than the Baker pneumonitis is problematical.

Common Diseases

The two diseases, feline pneumonitis and feline panleukopenia, are commonly encountered and considerable detailed information is available regarding their etiology, pathology, and treatment.

Feline Pneumonitis.—This disease, recognized for many years, is highly contagious, chronic, and of long duration (30 days). It is characterized by marked sneezing, coughing, and nasal and ocular discharge. The causative factor, however, has only recently been determined. Baker,[6] in 1942, reported a virus, psittacosis-like in nature, to be the cause. The disease is characterized clinically and anatomically by conjunctivitis, rhinitis, sinusitis, tracheitis, bronchitis, pneumonia and, in severe cases, empyema and vestibular ataxia. It occurs without vomiting, diarrhea, or lesions of the intestines. In severe cases, necrosis of the bronchial and alveolar epithelium is found.

Nature of the Virus.—Baker[5] found the virus to be resistant and stable, and it survives in frozen tissue. This new member of the psittacosis-lymphogranuloma group drew much attention among virologists because it was easy to study. When Hamre and Rake[7] found that this virus would infect mice, grow on chicken embryos, and produce elementary bodies in both, they chose it for study to gain information regarding the viruses of the psittacosis-lymphogranuloma group. The organism was named *Miyagawanella felis*. The particles of this psittacosis virus are larger than some bacteria, and it is these large viruses that lend themselves to alteration when treated by antibiotics and sulfonamides.

Nature of the Disease.—Uncomplicated feline pneumonia seldom terminates fatally except in the very young cat. Nevertheless, the disease is highly debilitating and has a lengthy course, up to thirty days. When an animal has eliminated the virus, immunity is lost rapidly and, if again exposed, reinfection will occur. Cats may recover but have been known to carry the virus for sixty days after clinical recovery. Mice, also, become infected with the virus and are undoubtedly a factor in control. The disease is known to exist simultaneously with panleukopenia; this sometimes complicates the diagnosis.

At the onset, sneezing is severe and the resultant virus-laden nasal spray is probably the chief means of transmission. The sneezing phase is followed by diminished appetite, weight loss, and signs of an unkempt coat. As the course progresses, the sneezing diminishes, but a sinusitis persists and, on rare occasions, the infection extends posteriorly to the ethmoid and sphenoid sinuses, the labryinth, balance center, and to the inner ear. Vestibular ataxia and aural nystagmus occur and the patient is unable to walk without staggering. The gait may become so involved that the animal will roll over and over, usually only in one direction. The labyrinthitis may be so severe that ataxia may exist for two or three weeks. In a few cases, when the ataxia has entirely cleared, the head may always be held in a tilted position with one ear lower than the other. In severe cases a meningitis would be suspected, but we have not found this in our cases. In one necropsy we did find a thick, milky exudate in the bulla ossea. We have not attempted surgical drainage of the bulla.

As the sneezing subsides, a nonproductive cough develops. This may become severe. Pneumonia may or may not develop. Pneumonic lungs, at necropsy, are grayish, with densely consolidated areas, particularly in the anterior lobes. During the course of the pneumonia, empyema may develop. This is manifested by dyspnea and an elevated temperature. We have performed thoracentesis on some of these cases and in one instance aspirated 100 cc. of fluid. In other cases, lesser amounts were taken. This was accomplished by inserting a 16-gauge needle into the pleural cavity just anterior to the heart. If the animal was handled slowly and not restrained, the operation could be done without anesthesia and apparently without much discomfort. In one extreme case, where the patient was cyanotic and dyspneic, the excitement of the procedure caused death before the needle could be inserted. In those cases where fluid was withdrawn, immediate improvement was noticed. Most of the cases recovered.

Nature of the Treatment.—The feline pneumonia virus, even though much larger than some bacteria, develops either intracellularly or extracellularly, but conforms to the characteristics of a virus in its host-parasite relationship. These large viruses, particularly the psittacosis-lymphogranuloma group, can be altered by sulfonamides and antibiotics. Weiss[8] and later Gogolak and Weiss[9] set up procedures to test the value of these drugs in controlling the growth of the virus in chicken embryos. They tried sulfonamides, penicillin, aureomycin, terramycin,® streptomycin, and chloromycetin.® Streptomycin and chloromycetin were not effective. Sulfonamides and penicillin altered the growth markedly, while aureomycin and terramycin inhibited the growth.

McKercher[10] then evaluated these agents on the disease in cats. He used aureomycin, terramycin, chloromycetin, penicillin, and streptomycin. All of the antibiotics used, with the exception of streptomycin, produced improvement in the clinical appearance of the infected kittens. Evaluation of the treatment was based on the cessation of sneezing and the capacity of the drug to produce virus-free nasal exudate. On the basis of these criteria, aureomycin, 2.5 mg. per pound, given subcutaneously daily for four days proved to be most satisfactory. Terramycin was not used parenterally, but when used orally was more satisfactory than oral aureomycin. Treatment with chloromycetin and penicillin resulted in improvement of the clinical appearance of the kittens, but it had little effect on eliminating the virus from the nasal exudate. The improvement was probably due to the bacteriostatic action of these drugs on the secondary infections. Streptomycin did not alter or influence the course of the disease in any way.

Experimentally, it seems possible by means of terramycin and aureomycin to eliminate the virus from the patient, but it is doubtful if this can be accomplished consistently on a clinical basis because the patients are not always so well controlled. However, this should not be interpreted as indicating that either drug would not control an outbreak of the disease. McKercher[10] produced evidence that the sneezing was suppressed by the use of the drugs and the elimination of this mechanical factor is important in preventing dissemination of the infection. James *et al.*[11] found that aureomycin and terramycin, when used repeatedly in feline pneumonitis, did not produce increased resistance of the organism to the drugs.

McKercher,[12] in his course of study, examined the possibility of developing a vaccine that might produce satisfactory immunity or at least modify the disease. The nature of the disease and its relation to the psittacosis-lymphogranuloma-pneumonitis group lessens the possibility of developing a vaccine for lifetime immunity, but the extreme communicability of the disease produces a major health problem in the veterinary hospital and any relief from the danger would be worth-while to the director of a small animal hospital. An egg-cultivated vaccine, which showed some promise, was produced but further work needs to be done to evaluate it. If a harmless vaccine could be developed that would produce immunity long enough to protect a cat from pneumonia while it is in a veterinary hospital, it would be both worth-while and welcome.

Infectious Panleukopenia.—Infectious panleukopenia is a highly contagious, usually fatal, disease of young cats, characterized by sudden high temperature, extreme dehydration and marked panleukopenia. In the past, this disease has been referred to as cat distemper, show fever, cat plague, yellow vomit, gastroenteritis, and infectious feline enteritis. Epizootics of the disease have been recognized in all parts of the world since the latter part of the nineteenth century. It affects the domestic cat, leopard cub, lynx, pampas cat, marbled cat, cuffer cat, and raccoon. It is unknown in the lion, tiger, jaguar, puma, civet, mongoose, polecat, and marten.

The etiology of this disease has long been recognized as a virus. Verge and Cristoforoni,[13] in 1928, suggested that the causative factor might be a filterable virus. Following this, Hindle and Findlay,[14] in 1932, definitely proved that the causative factor was a filterable virus. It was not until the early forties, however, that the nature of the pathology was understood. Infectious panleukopenia virus primarily affects young cats. Older cats which have not been exposed to the disease are also highly susceptible. In our study, homeless cats picked up in alleys, where there were ample chances of exposure to the disease, proved in every instance to be immune to

the infection. An attack of this virus renders the animal immune for life.

The disease is transmitted primarily by direct contact, but urine, feces, nasal and ocular discharges, vomitus, and blood carry the virus, and cats coming into contact with contaminated clothing, utensils, bedding, or food are readily infected. Under normal conditions, the virus will live for several days, or even weeks, in such material. Torres,[15] in his work with wild cats, found lice, fleas, and other blood-sucking parasites to be carriers of the virus and thus capable of transmitting the disease.

The virus, upon invading the tissue of a susceptible animal, is selective as to the tissue in which it elects to grow. It invades primarily endothelial and epithelial cells, concentrating in the liver, kidney, spleen, mesenteric lymph nodes, the terminal portion of the small intestine, and the bone marrow. The visible lesions caused by the virus are slight, unless the animal lives long enough to be invaded by secondary organisms. The uncomplicated pathological picture at necropsy shows an extremely dehydrated, emaciated animal, having moderate mucopurulent ocular and nasal discharges. The remaining structures are normal except the stomach, which contains 1 or 2 drams of bile-stained fluid, and a moderate degree of hemorrhagic enteritis in the terminal 6 to 12 inches of the ileum. The most constant gross diagnostic lesions are the greatly enlarged, hemorrhagic, edematous mesenteric lymph nodes draining the terminal ileum. When the cavities of the long bones are opened, the marrow appears to be greasy and almost semifluid. It does not have the firm appearance that is seen in normal bone marrow. However, it shows this semifluid consistency only through the aplastic stage of the disease, when the leukocytes have almost entirely disappeared from the blood.

The microscopic pathological changes are more marked.[16,17] The lymph nodes are hyperemic and proliferation of the reticuloendothelial tissue is so extensive that in many instances this tissue equals in amount that of the lymphoid tissue. The bone marrow at the height of the infection is almost entirely aplastic or nonfunctional and fat cells almost entirely replace the cell-producing areas of the marrow. The toxin produced by this virus is so severe that it causes great destruction of liver tissue; in some instances, a majority of the liver cells being destroyed. Similar changes are seen in the kidneys. Most of the cells of the renal tubules are destroyed and in many instances the organ is left almost nonfunctional.

Symptoms.—The incubation period of infectious panleukopenia is two to nine days; less than six days in the majority of cases. In artificially infected animals, the peak of the first temperature rise often appears in forty-eight hours. The course of the disease is rapid and the temperature variation much like that of canine distemper, in that it rises rapidly to a peak of 104.5 to 105.7 F., stays there for a day, and returns to almost normal as rapidly as it rose. The animal shows lassitude when the temperature starts to rise, but it usually does not stop eating until the second temperature rise, which is usually forty-eight hours later.

Although the animal eats and drinks, loss of weight and dehydration begin to appear at the first rise of temperature. The coat is rough and unkempt. Near the height of the second temperature rise, the cat is depressed and pays little attention to anything. It lies prone on its abdomen, its head on its front paws, or sometimes on the floor or some other supporting object. Death usually occurs shortly after the peak of the second temperature rise.

Vomiting occurs in about one-third of the cases, usually near the peak of the second temperature rise. In cats being cared for at home, the percentage showing vomiting seems much greater than in those animals cared for under hospital conditions. This may be because the owner forces the cat to eat. Also, under home conditions it is subjected to considerably more activity, such as walking.

Diarrhea occurs in some cases, especially in those of longer duration. This seems to be due to secondary invaders causing severe enteritis, with destruction of much of the epithelial lining of the bowel.[18]

The duration of the disease is usually three to seven days, with an average of about four days. Often the symptoms are variable and in some instances so indefinite that they are confused with those of other diseases. In rare cases, animals remain perfectly well for a week after being inoculated, then the disease becomes acute, the animals dying within twenty-four to forty-eight hours following the first clinical symptoms. In a few instances, the disease

may follow a mild course and recovery may occur rapidly.

Mortality.—The mortality of the disease is high. Lawrence[19] reported it to be about 66 per cent. In our cases, mortality has been as high as 90 per cent when not treated. However, with the new antibiotics, mortality can be reduced sometimes to about 50 per cent. Recovery, once it takes place, is rapid, providing that severe secondary infection does not develop.

Diagnosis.—Accurate diagnosis of infectious panleukopenia can be made by the use of total and differential leukocyte counts.[20] The virus has an inhibitory effect on bone marrow activity, rendering it aplastic and nonfunctional in such a manner that by the fourth day the leukocytes have almost entirely disappeared from the circulating blood. Two marked changes occur in the leukocytes; the virus inhibits production of leukocytes, and neutrophils disappear from the blood at the rate of about 4,000 per cubic millimeter of blood per day and are almost entirely gone at the end of the fourth day. The lymphocytes and eosinophils also disappear from the peripheral blood but not as rapidly as do the neutrophils. If recovery takes place and the inhibitory effect on the hematopoietic system ceases, recovery is spontaneous and cell division is resumed almost immediately in the bone marrow, so that young neutrophils are poured into the blood stream. The leukocyte count increases from 4,000 to 6,000 per cubic millimeter of blood each day until the normal level is reached. When this takes place, the cat will live, providing the damage done by dehydration and the toxic destruction of the liver and kidney tissue has not been too great.

Treatment.—Specific homologous antiserum is effective if given early, before the inhibitory effect of the virus has caused the bone marrow to become aplastic. However, the case is usually not seen until the virus is active and at that time benefit from homologous antiserum is questionable. Recently, the newer antibiotics have shown good results. It is doubtful whether the antibiotics have any effect on the virus of the disease, a quick acting variety which leaves the body rapidly. However, one is not so concerned with killing the virus as combating the secondary infections which usually kill the animal. Aureomycin, terramycin,® and penicillin therapy have been beneficial. These, plus large quantities of saline and glucose, have greatly lowered the mortality and morbidity from this disease. Some practitioners have found whole blood transfusions to be of benefit.

Prophylaxis.—Immunity to panleukopenia may be produced by the use of homologous serum or with killed-tissue vaccine. Homologous serum, 1 cc. per pound, produces passive immunity for five to ten days. The serum is not used as widely as previously because of its high cost and the short immunity.

The vaccine has generally replaced serum because it is effective and relatively inexpensive. The only vaccine available is a tissue suspension product made from the organs of infected cats carrying antigens of the panleukopenia virus and many of the secondary bacteria associated with the disease. So far, it has been impossible to cultivate and attenuate live virus to make a live-virus vaccine. The antibody response to the vaccine is said to occur within a matter of hours in a healthy cat providing it is approaching maturity (6 months or more). We have made it a practice to use this vaccine immediately upon arrival on all cats to be hospitalized or boarded. This procedure has almost eliminated any outbreaks of panleukopenia among our patients.

To immunize a cat, we recommend that it be vaccinated at the age of 5 months with two, and preferably three, doses of this killed-tissue vaccine at two-week intervals and that a booster inoculation of one dose of vaccine be given each six months thereafter. Kittens may be vaccinated younger than 5 months but in that event we recommend that the vaccine be repeated at about 7 months of age and booster inoculations be given each 6 months thereafter. In our experience, recovery from an attack of panleukopenia produces solid immunity for life.

Infectious Anemia.—Flint and Moss[21] reported an anaplasmosis-like disease in a 4-year-old male cat which was brought in for treatment suffering from an abscess in the neck and in an extensively debilitated and anoxemic condition. The illness had been present for several months. On routine blood smear examination, small round bodies resembling *Anaplasma marginale* were discovered attached to the red blood cells. Flint and Moss were able to reproduce this condition by an intraperitoneal injection of 0.5 cc. of blood into other cats. It

took about eighteen to twenty-one days before the bodies appeared attached to the erythrocytes. A similar disease has been reported in swine and cattle in the United States. However, this is the first reference to such a disease in the cat.

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Prolapse of the Rectum of a Horse

This 12-year-old gelding was fed corn, oats, and poor hay through the winter months of 1950. As a result, the feces were extremely solid and the colon was probably devitalized.

Fig. 1—Twelve-year-old gelding with 39-inch prolapse of the rectum.

Early in May, the horse was turned out on lush orchard grass and blue grass. Five days later, it had developed a 39-inch prolapse of the rectum and colon. The small colon of the horse is about 10 feet long and is attached to the sublumbar region by the colic mesentery. The prolapse was probably due to the sudden change in feed, which produced a diarrhea severe enough to start an intussusception of the weakened colon and resulted in a torn mesentery and a prolapse.

Because the horse was not needed on the farm, it was destroyed.—*G. S. McKee, D.V.M., Washington, Pa.*

Experimental Production of Bovine Hyperkeratosis with a Feed Concentrate Exposed to Vapors of a Highly Chlorinated Naphthalene

R. P. GREGORY, Jr., B.S., D.V.M.; J. C. WISE, D.V.M.;
DENNIS SIKES, M.S., D.V.M.

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THE CONDITION known as hyperkeratosis or x disease was first described by Olafson.[3] Sikes and Bridges[4] produced the condition by the feeding of a proprietary, refined, highly chlorinated naphthalene. A more comprehensive study of the chlorinated naphthalenes and petroleum products by Sikes, Wise, and Bridges[5] followed the original publication. Bell[1,2] also produced the disease with lubricants and highly chlorinated naphthalenes.

These data proved that highly chlorinated naphthalenes are capable of producing hyperkeratosis.

The purpose of this study was to determine if hyperkeratosis in cattle might be produced from feeding a concentrate or hay which was exposed to the vapors of a highly chlorinated naphthalene (essentially octachloronaphthalene) when painted on the walls of a storage room. If this were possible, feed should not be stored in bins or containers which may have been exposed to these substances.

A contribution from the inter-regional project entitled "X-Disease (Hyperkeratosis of Cattle)," a cooperative study participated in by the Agricultural Experiment Stations, the Agricultural Research Service, U. S. Department of Agriculture, and the Tennessee State Department of Agriculture.

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Dr. Gregory is associate veterinarian, Tennessee Agricultural Experiment Station, Knoxville; Dr. Wise is now in private practice in Steubenville, Ohio; and Dr. Sikes is on leave from the University of Tennessee Agricultural Experiment Station.

PROCEDURE

In February, 1953, a room, 9 ft. 10 in. by 13 ft. 10 in. and 8 ft. 3 in. in height, was sealed with new pine paneling. The two windows were sealed and air passage in and out of the room was kept at a minimum. Approximately 27 per cent of the total wall surface in the room was painted with octachloronaphthalene dissolved in halowax 1000 which is a liquid mixture of the lower chlorinated naphthalenes and the only solvent found that

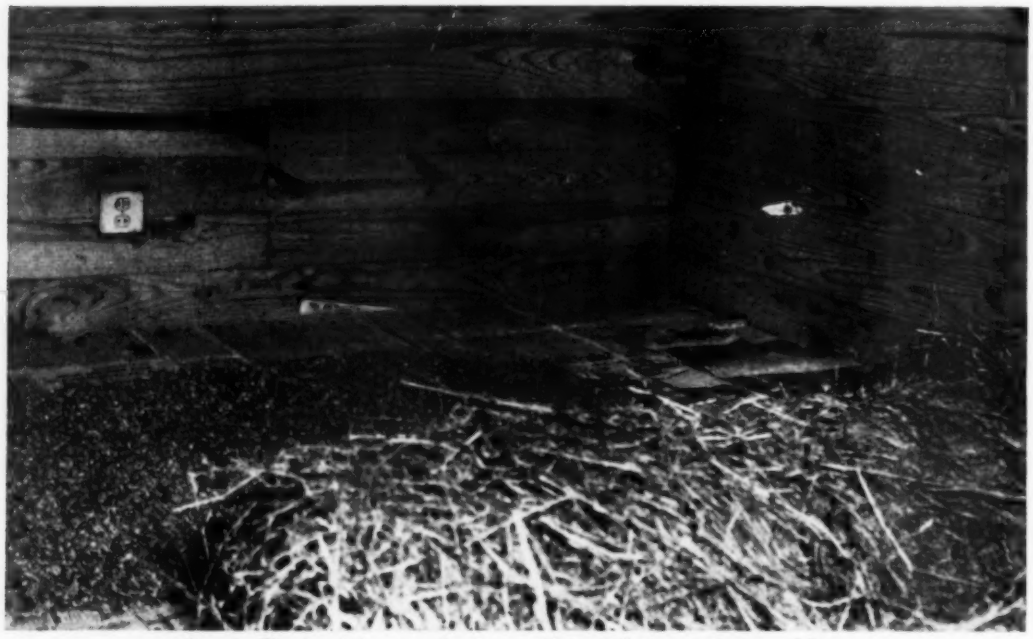

Fig. 1—The treated room, showing position of the concentrate and hay.

would dissolve octachloronaphthalene. This chlorinated naphthalene mixture was painted on one end wall and one-half of each adjacent side wall, extending from the floor to the height of 4 ft.

Then, 100 lb. of a mixed feed concentrate containing oil meal, corn and hominy meal, wheat bran, distillers' and brewers' grains, gluten feed, molasses, and minerals was poured on the floor approximately 2 to 3 ft. from the painted walls. Fifteen bales of hay were also stored in the room, placed 1 to 6 ft. from the painted walls. There was no direct contact between the walls and the concentrate or the hay. This arrangement would permit contamination of the feedstuffs only by the vapor of octachloronaphthalene. After a storage period of ninety days, the concentrate was used in a feeding experiment. A portion of the concentrate was unexposed to the chlorinated naphthalene and fed to a control animal which remained healthy and made a good growth rate during the experiment.

SYMPTOMS AND PATHOLOGICAL CHANGES

On May 9, 1953, a 350-lb. Jersey steer in excellent condition was chosen for the experiment. A total of 87 lb. of this exposed concentrate was consumed at the rate of 1 to 2 lb. per feeding, over a period of 138 days, along with good quality hay. The animal showed evidence of distaste for the concentrate, probably due to its odor. Intermittent consumption of the concentrate resulted.

Twenty-two days after the experiment was initiated, when the animal had consumed approximately 19 lb. of the concentrate, it was lacrimating slightly.

On the sixty-second day, an area of thickened skin approximately 3 in. long was noticeable on the dorsal surface of the neck, and the animal was beginning to lacrimate excessively. When examined on the eighty-fifth day, the affected area had enlarged anteriorly and posteriorly. By the 108th day, the skin on the lateral surfaces of the neck had become thicker and was developing folds.

By the 121st day, the skin over the masseter muscles was showing some thickening and the skin of the intermandibular and pharyngeal areas was also showing some involvement. When the feeding of the concentrate was discontinued, on the 138th day, the steer was in poor condition with periods of anorexia. Throughout the experimental period, there had been intermittent periods of diarrhea.

The animal was then given a good ration of mixed feed concentrate and hay, but it became progressively weaker, with periods of anorexia, and the hyperkeratosis became general over the body. On the sixty-first day after the exposed concentrate was discontinued the animal was unable to stand. Necropsy was performed on the sixty-eighth day.

Fig. 2—Jersey steer affected with hyperkeratosis.

The carcass was thin and emaciated. The keratin formation was greatest in the area of the neck, face, and scrotum. The spleen was pale. The liver appeared normal with exception of some congested areas. The gall bladder was enlarged two to three times its normal size, and the bile was thin, dark-urine colored, and had a fetid odor. The intima of the gall bladder was extremely congested and the wall was approximately three times the normal thickness. Proliferations, mucoid in nature, were found in the cystic duct and the bile duct. A severe gastritis was present. The mesenteric lymph nodes were congested and some ecchymotic hemorrhages were found in the cecum. The small intestine was congested throughout its length and there were isolated areas of hemorrhagic enteritis. There was slightly more fluid than normal in the pericardial sac. The heart and lungs appeared normal. The mucosa of the trachea appeared somewhat congested.

DISCUSSION

This study shows that a feed concentrate stored in the presence of a chlorinated naphthalene became impregnated with toxic properties. The contaminated concentrate, when fed to a susceptible animal, produced symptoms and lesions of hyperkeratosis. It is highly probable that a much shorter time of exposure of feed to the vapors would be just as effective in producing the disease. Reducing the degree of concentration and the distastefulness would allow for greater and more regular consumption of the feed. The exposed hay is being fed in another experiment.

SUMMARY

1) A feed concentrate can become impregnated with toxic properties from the vapor of octachloronaphthalene.

2) This contaminated concentrate can produce hyperkeratosis.

3) Feedstuffs should not be stored where there is a possibility of contamination by highly chlorinated naphthalenes or their vapors.

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Laboratory Diagnosis of Rabies

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Many brains from animals suspected of being rabid arrive in the laboratory in a state of decomposition and are unfit for microscopic study. It is, therefore, necessary to inject brain tissue preparations into laboratory animals in order to obtain a diagnosis. Usually the content of cadaver bacteria in the brain is so great that the inoculated mice, rats, guinea pigs, or rabbits succumb within a day or so. In order to restrain the bacteria and yet permit rabies virus if present, to multiply, various antibiotics were incorporated and studied.

Terramycin® intravenously, 10 mg. in 3 ml. of distilled water to make a 1:20 brain suspension, was found to answer the purpose when 0.03 ml. of centrifugalized suspension was injected intracerebrally in mice.

Table 1 shows the results of a study of 10 field cases.

Conclusion.—(1) Street virus may be recovered from the brain of rabid animals in approximately the same time when treated with terramycin® as when not treated.

2) Apparently the antibiotic interferees neither with Negri body production, nor with the multiplication of the rabies virus in the inoculated animal.

3) No detrimental effect of the intracerebral inoculation of terramycin in the laboratory animal was observed during the forty-five days (observation period).

4) The surviving laboratory animals proved as susceptible as the fresh animals to a later challenge dose (intramasseter) of New York City rabies virus.

5) Three of four brains negative for Negri bodies on microscopic examination were also negative on animal inoculation, but the animal inoculation method detected one which was missed by the microscopic method.

From the Department of Pathology, Kansas State College, Manhattan.

TABLE 1—Terramycin-Treated Brains

Case (No.)	Animal	Clinical history	Microscopic finding	Animals inoculated	Virus isolated	Days of incubation
8266	Fox	Suggestive	+	Mice and rats	Yes	7 to 8
7692	Skunk	Suggestive*	−	Mice, rats, and guinea pigs	No	Released, 45 days
8390	Cat	Suggestive*	+	Rats	Yes	17
8432	Skunk	Suggestive*	−	Mice and rats	No	Released, 45 days
8604	Skunk	Suggestive*	−	Mice and rats	Yes	15 to 16
8616	Skunk	Suggestive*	+	Mice and rats	Yes	12 to 15
8653	Skunk	Suggestive*	+	Mice and rats	Yes	15 to 17
8663	Dog	Suggestive*	+	Mice and rats	Yes	12 to 15
8677	Coon	Suggestive*	−	Mice	No	Released, 45 days
8687	Skunk	Suggestive*	+	Mice and rats	Yes	12 to 15

*All animals had been suspected of having rabies and some had bitten people.

Oxytocin-Induced Udder Evacuation.—When oxytocin, in amounts from 30.0 to 1.5 I.U. per dose were injected intravenously immediately after the regular milking in 1 of a pair of twin cows, the resulting secretion was more than five times that of the control.—*J. Dai. Sci., March, 1954.*

NUTRITION

Pig Anemia Due to Copper Deficiency

In England, heavy losses from severe anemia occurred in pigs 4 to 7 weeks old raised indoors, although they had been given iron and seemed in good condition. The development of anemia was reversed and losses avoided when, at 26 days of age, copper sulfate was given orally for five days. The pigs soon resumed eating, their red cell and hemoglobin levels improved without further medication, but their growth rate remained unsatisfactory.—*Vet. Rec., June 5, 1954.*

Molasses Feeding Increases

In 1953, nearly 334 million gallons of molasses was fed to livestock, 100 million more than in 1950. Using 6.5 gallons of molasses as the equivalent in feeding value to 1 bushel of yellow corn, molasses would have been the cheaper feed in thirteen of the last fifteen years. It also makes feed more palatable and is a good binding agent, eliminating dustiness. Although molasses is slightly laxative, dairy cows can use 3 or 4 lb. daily and beef cattle considerably more. In many communities it is delivered in tank trucks.

The high nitrogen content of ammoniated molasses or of molasses containing urea helps rumen bacteria build proteins.—*Successful Farming, July, 1954.*

Iron Therapy for Calf Anemia

Anemia often develops in chicks, pups, pigs, rats, rabbits, and calves when they are on a milk diet exclusively. When the hemoglobin concentration of 356 calves, 1 to 105 days of age, was determined at weekly or biweekly intervals, values were highest the first fifteen days of life, gradually decreasing until 30 to 70 days of age, after which the hemoglobin level gradually increased. The hemoglobin levels varied with the individual but heifers had higher levels from birth to 75 days of age than males, and breed differences were also observed. Feeding 100 mg. of iron per day to moderately anemic calves increased the number of red blood cells and the hemoglobin level. Iron alone, or in combination, relieved the anemic condition whereas copper, cobalt, or manganese fed alone had no effect.—*J. Dai. Sci., July, 1954.*

The Iron Deficiency of Milk.—Milk, otherwise a fairly complete food, contains little iron, which is needed by the young to build red blood corpuscles. During the eighth and ninth month of human pregnancy, sufficient iron is stored in the baby's liver to meet its needs while it is on the milk diet. Thus, iron must be supplied to premature babies. —*Guernsey Breeders' J., July 1, 1954.*

Cob Powder in Cattle Feed

A one-feed mixture, including pulverized dehydrated cobs, to replace hay or other roughages in feeding cattle has proved practical at Iowa State College. It includes 4 parts of ground ear corn to 1 part of the following supplement: cob powder—800 lb., cane molasses—400 lb., soybean meal—556 lb., urea—100 lb., bonemeal—60 lb., limestone—40 lb., stilbestrol premix—40 lb., and dry vitamin A—4 lb.

Steers on this feed gained 3.13 lb. per day at a cost of 18.5 cents per pound, slightly better than when hay was included in the ration. Approval of the hormone mixture for general use has been requested of the Food and Drug Administration.—*Farm J., Aug., 1954.*

More Fats Used in Feeds

The rising surplus of grease and tallow is partly due to a decline in the use of fats and oils by the soap industry—from 18 lb. per capita in 1944 to 9.3 lb. in 1952.

The caloric value of fats in feed is 2.5 times that of corn which, in the past, has been the chief source of caloric energy. At 7.5 cents per pound, fats are the equivalent of corn at $1.80 per bushel. Part of the value of fats in feeds is that they control dust, always an annoying problem. The estimated surplus of fats in 1953 was 810,000,000 lb., and if formulated animal and poultry feeds contained 2 per cent fat, the levels widely used today, it would require twice that much annually.—*J. Agric. and Food Chem., Feb. 3, 1954.*

Radioactive sulfur can be traced to a sheep's wool within two weeks after it is fed. Feeding sulfur affects the wool texture, retarding the relaxation of the fibers after they are stretched.—*Sci. News Letter, July 17, 1954.*

Ammoniated Molasses Jag

Young cattle fed a growing ration containing ammoniated molasses, in an experiment at Kansas State College, developed temporary mental symptoms. Those affected ran into objects and through fences. The ration contained a 15 to 33 per cent protein equivalent of this urea mixture supplement. When the supplement was removed, the condition disappeared.

Mississippi State College had a similar experience while feeding a 15 per cent ammoniated molasses supplement, but at Oklahoma A. & M. College no symptoms appeared, even when 16 to 33 per cent protein equivalent of ammoniated molasses was fed. —*Farm J., June, 1954.*

Tolerance of Sheep to Sodium Chloride

When ewes were fed rations containing 0.5, 4.8, 9.1, and 13.1 per cent of sodium chloride for 253 days through their growing, gestation, and early lactation periods, the high salt levels caused no significant difference except that the ewes on the highest salt level showed a greater weight loss during lactation and raised fewer lambs. The rate of gain of the lambs was not affected.—*J. Anim. Sci., May, 1954.*

Chronic Sodium Chloride Toxicity

Albino rats were used to study the chronic effect of sodium chloride in the diet. They were fed purified rations containing from 0.01 to 9.8 per cent of sodium chloride. Water consumption varied with the amount of salt in the diet. The appetite was depressed by a low sodium diet. Edema developed in 18 per cent of the rats on diets with more than 7 per cent sodium chloride. All diets high in salt produced important lesions in the kidneys, lesser lesions in other tissue, and arterial hypertension after nine months.—*J.Am.M.A., Feb. 20, 1954.*

Alfalfa Saponin and Ruminant Bloat.—When a saponin, isolated from alfalfa, was dissolved in water and given to sheep, goats, and a heifer, it produced bloat, ranging from moderate to severe, in eight of ten trials.—*AFMA Nutr. Abstr., July, 1954.*

Preventing Bloat from Ladino

A Washington farmer was able to graze 3 mature cattle to the acre on a combination of Ladino clover, and orchard, brome, and alta fescue grasses, without causing bloat, by fertilizing with nitrogen twice a year. This stimulated the growth of the grasses which retarded the Ladino growth somewhat. Then, by using a three-week rotation with one plot being irrigated while a second was growing and a third was being grazed, the Ladino was allowed to get tough and a little dry before being used. The best time to start grazing is at the bloom stage.—*Western Livestock J., May, 1954.*

Salt Poisoning

Salt poisoning is not uncommon in pigs and poultry in Ireland. The salt content of an animal's stomach should be 0.5 to 0.75 per cent but, when it exceeds 2.0 per cent with excessive thirst and nervous symptoms, a diagnosis of salt poisoning is believed justified. In one instance, 400 hens were affected when a high tide washed sea water into the brook from which they drank. In another instance, pullets died after being fed a meal which subsequently was found to contain 20 per cent of salt. Pigs, which died with typical symptoms after being fed rejected vegetables in brine, were found to have a stomach content of 10 per cent salt on a dry basis.—*Irish Vet. J., Nov., 1953.*

A Liver Extract for Scouring Pigs

Scouring piglets usually remain somewhat unthrifty and some become stunted or die. This condition seldom occurs on clean ground and in favorable weather. A satisfactory therapy has been found in an injectable solution containing liver extract, vitamin B_{12}, vitamin B pyophosphate, and folic acid. When used subcutaneously in 228 scouring pigs in six herds, the feces gradually became darker and less fluid until, by the third day, diarrhea had ceased and the pigs had regained their thrifty appearance. Eight required a second dose five days later but none failed to respond.—*Vet. Rec., April 10, 1954.*

EDITORIAL

The Art of Physical Diagnosis, Emphasizing Palpation

Old methods must give way to new, but surely not before the new have proved their adequacy and practicability.

Recently, a prominent physician[1] expressed concern about "the vanishing art" of physical diagnosis, commenting that many diagnostic errors occurred "not because of ignorance but . . . of lack of observation of the patient." Among the reasons cited was the tendency to accept a diagnosis from a laboratory technician or "some other specialist." Young physicians, he fears, are apt to feel that if all the tests are negative, the patient needs no attention and their job is done when actually it "should be just beginning." This criticism may seldom apply to veterinarians but, with the increasing dependence on office or other laboratory diagnosis, it may deserve some thought.

It is only natural for our elders to resist the abandonment of proved methods, an attitude that many be charged to standpatism but often might better be attributed to "thoroughism." Some may recall the concern when the tuberculin test first threatened to supersede the classical diagnostic technique of inspection, palpation, percussion, and auscultation. In retrospect, the success with the test might cause that attitude to seem ridiculous.

Some new diagnostic techniques may prove impractical, others may have value merely as supplements to the established methods. For instance, laboratory tests for pregnancy seem impractical for species in which the uterus can be palpated, while tests for ketosis, mastitis, and many other conditions are valuable chiefly as adjuncts to physical diagnosis.

Actually, no diagnostic approach should be neglected, for is not the ability to make accurate diagnoses the acid test for success in any type of medical practice?

Diagnosing disease must always be an individualistic procedure, each case requiring thorough observation and analysis, regardless of how much it may follow the pattern of other cases or how prevalent those other cases may be. Treatment also must be individualistic but, being somewhat more routine, it usually requires less ingenuity.

One of the veterinarian's diagnostic problems was aptly emphasized by the late Will Rogers, when he said, "Personally, I have always felt that the best doctor in the world is the veterinarian. He can't ask his patients what is the matter—he's got to just know." This, however, might well bring the rejoinder that, while symptoms in the dumb animal may be masked by fear, they won't be by ignorance or dishonesty, unless these be contributed by the owner. And herein lies an essential requirement for the good veterinary diagnostician—he not only must have a talent for gaining the confidence of his patient but he also must be so thoroughly familiar with the species that he can readily interpret what the animal is indicating by its attitudes and signs.

While the fundamental technique for clinical diagnosis is the same for all, the application differs with the species. This is especially true with palpation which has limited value in the firm-bodied, naturally uncooperative pig but can be a highly developed art, particularly in small animal and equine practices. It is indispensable in diagnosing abdominal abnormalities. Generally, external palpation increases in value as the size of the patient decreases, but the reverse is true with the more revealing internal palpation, most readily applied in the equine and bovine species. However, the narrow colic mesentery of the latter limits the examination to the more dorsal organs, while the chief limiting factor with the equine patient is the length of the diagnostician's arm.

It can be said with little fear of refutation that, in equine "colic," no procedure approaches rectal palpation in positive diagnostic value. In acute cases it should always precede the administration of drastic peristaltic stimulants, especially those given hypodermically, since they may aggravate certain conditions or even cause visceral rupture. Once the affliction is determined, prompt, intelligent therapy can be applied, or needless medication and suffering can be

[1]Alvarez, W. C.: The Vanishing Act of Diagnosing with Eyes and Ears. M. Rec. and Ann., May, 1954 (abstr. in J.Am.M.A., July 24, 1954).

avoided. Laparotomy, a frequent diagnostic procedure in small animals, occasionally may be necessary in large animals also.

Reams could be written on diagnostic procedures, for what phase of medicine is more important or intriguing? And what finer epitaph could one wish than "He excelled at diagnosis"?

Viability of Strangulated Bowel

On the rare occasions when a veterinarian must decide whether a strangulated section of bowel should be replaced or resected, the following abstract from the *American Journal of Surgery* (July, 1954: 178) may have value.

The factors most responsible for the local and general disturbances which are associated with strangulation of the bowel are (1) circulatory impairment and (2) bacterial invasion. The venous strangulation soon results in tissue anoxia and thrombose formation. The bacterial invasion is via the lymphatics, progressing from the tips of the villi to the serosa. When the strangulation is reduced, the viability of the affected loop is judged by the rate of return of normal pulsation, color, temperature, and peristalsis. If not definitely normal in twenty minutes, resection and anastomosis should be done. If the loop is replaced it should be accompanied by antibiotic therapy.

Strangulation of the intestine frequently is associated with herniation. In small animals, it also may result from adhesions or entanglement with the omentum, probably following trauma. In swine, it is not infrequent since hernias are common. In cattle, partly because of the festooned arrangement of the small intestine, strangulation is rare.

In the equine species, with their wide mesentery, strangulation of the small intestine is relatively common. However, we know of only one reference to successful intestinal anastomosis in the horse.[1] Had this been attempted in the days before horse power replaced the "power horse," it might have saved many valuable draft animals. For instance, about thirty years ago, necropsy on a champion draft stallion revealed a loop of intestine herniated through the epiploic foramen. In 1940, when a distended loop of intestine was palpated in a mare, it was reduced, upon laparotomy, by incising the tissue band which constricted the ends of the loop. The mare rallied but died in eighteen hours, necropsy revealing the abruptly demarcated gangrenous portion of intestine. In a similar case in 1942, when the band, probably the stem of a small pedunculated mesenteric tumor, was cut, the loop of intestine immediately emptied and could not be identified. This horse never missed a meal. In a third case, doomed by procrastination, the intestine had herniated through a rent in the mesentery.

In 2 earlier cases, distended loops of intestine had been reduced by manipulation *per rectum*. One horse immediately started eating but the second soon died, necropsy revealing the gangrenous small intestine.

[1]Zontine, W. J., and Hughes, W. F.: Equine Laparotomy. J.A.V.M.A., 124, (March, 1954): 182.

Dr. William Moore—1884-1954

Dr. William Moore, Sr., former state veterinarian of North Carolina and widely known and respected leader in livestock sanitary and veterinary circles for many years, passed away July 12, 1954, aged 69. He had been in excellent health until shortly before his death.

Born at Sandy Spring, Md., Oct. 22, 1884, Dr. Moore received a high school education before enrolling in the U. S. College of Veterinary Surgeons in Washington, D. C., from which he graduated in 1911. He engaged in private practice in Baltimore and Cambridge, Md., before going to North Carolina in 1917 as assistant state veterinarian. He was appointed state veterinarian in 1918 and held that office for nearly thirty years, when he retired to take over the practice of his late son, Dr. William Moore, Jr. He retired from practice in 1953.

Dr. Moore studied law and passed the North Carolina bar examination in 1922 but never practiced. He was president of the North Carolina Veterinary Medical Association in 1920-1921, president of the U. S. Livestock Sanitary Association in 1946, served on the North Carolina Board of Veterinary Examiners from 1922 to 1931, and was chairman for seven of the ten years.

He also served one term (1935-1939) as a member of the AVMA Executive Board from District IV, and was active in Association affairs and committee work for many years. He was a past-president of the Guernsey Breeders Association, and a Scottish Rite Mason.

Surviving are Dr. Moore's widow, the former Mildred Marvel; a son, Dr. Samuel L. Moore (GA '53) of Raleigh; a daughter, Mrs. Floyd Fletcher of Durham; two brothers, a sister, and three grandchildren.

CURRENT LITERATURE

ABSTRACTS

The Sheep Mite, Psorergates Ovis

Psorergates ovis mites were found in skin scrapings taken from fine-wool Merino ewes, yearling ewes, and a ram. The adult female and male, nymph, larva, and egg were found on the ram. Lamiman's modification of Berlese medium was found superior to 10 per cent potassium hydroxide for finding the mites. The mites were found on 2 previously noninfested fine-wool Merino ewes approximately nine months after they had been in contact with an infested fine-wool Merino ewe. —[*John W. Davis: Studies of the Sheep Mite, Psorergates Ovis. Am. J. Vet., Res., 15, (April, 1954): 255-257.*]

Studies on Neoascaris Vitulorum

The resistance of *Neoascaris vitulorum* eggs to certain chemical agents and physical factors under tropical conditions was studied. The "clean" eggs had low resistance to the effects of direct tropical sunlight; the nonembryonated ova had a lower resistance than the embryonated ova. However, ova protected by the stool were able to survive longer periods of exposure to sunlight, the time varying inversely with the temperature but directly with the size of the fecal mass, the amount of rainfall, and the amount of vegetation. The ova were resistant to desiccation and to the usual concentrations of chemical disinfectants. While hot water was highly lethal to clean eggs or egg masses devoid of extraneous matter, it was only partially effective when applied to eggs within fecal lumps. The temperatures and periods of exposure to the different agents that proved destructive to the eggs are given in a table. A suggestion on pasture rotation is included.—[*P. G. Refuerzo and F. S. Albis-Jimenez: Studies on Neoascaris Vitulorum. II. The Resistance of the Ova to Certain Chemical Agents and Physical Factors Under Tropical Conditions. Am. J. Vet. Res., 15, (July, 1954): 440-443.*]

Parasitism in Sheep on Rangeland

Twenty wether lambs, raised on ranges of the University of California field station at Hopland, were necropsied at the rate of 4 per month from February to June, 1953. The average number of nematodes in the abomasum and small intestine was 527 and 424, respectively. In no case were more than 11 nematodes found in the large intestine. *Ostertagia circumcincta* accounted for approximately 95 per cent of the parasites in the abomasum. Trichostrongylus spp. and Nematodirus spp. occurred in approximately equal numbers and together accounted for about 98 per cent of the nematodes in the small intestine. Species of these genera found were *Trichostrongylus vitrinus, Trichostrongylus colubriformis, Nematodirus spathiger,* and *Nematodirus filicolis.* Phenothiazine, as used in the work, was ineffective. Lambs were treated four times at intervals of eighty, forty-six, and twenty-one days. Dosages were 12.5, 12.5, 18.75, and 25.0 Gm., respectively. Body weights of treated lambs averaged 21 lb., 57 lb., 69 lb., and 76 lb., respectively. Examination of the phenothiazine revealed that 24 per cent of the particles were greater than 33 μ while only 39 per cent were less than 20 μ in diameter. It was suggested that the large particle size may have played a part in the ineffectiveness of the phenothiazine.—[*N. F. Baker, W. M. Longhurst, D. T. Torell, and W. C. Weir: Preliminary Studies of Parsitism in Sheep on Rangelands. Am. J. Vet. Res., 15, (July, 1954): 356-360.*]

Teeth of the Ox in Clinical Diagnosis

The teeth and jaws of over 10,000 cattle were examined to determine the gross anatomy and physiological response of those structures to environment and attrition. That portion of the data obtained which might be useful to the veterinary clinician is set forth, including a table of age approximation in older animals.—[*Norman L. Garlick: The Teeth of the Ox in Clinical Diagnosis. II. Gross Anatomy and Physiology. Am. J. Vet. Res., 15, (July, 1954): 385-394.*]

Brucella Immunity

In two groups of heifers inoculated with a vaccine prepared from strain 19 (BAI) of *Brucella abortus* and subjected, when pregnant, to a conjunctival exposure of 5 million and 50 million virulent organisms, the resulting antiabortive values were 50.0 per cent and 22.0 per cent, while anti-infectious immunity reached to 50.0 per cent and 11.0 per cent. Similar experiments in animals vaccinated with the nonagglutinogenic strain "B" (Rosenbusch) revealed antiabortive values of 47.6 per cent and 14.2 per cent, while the rate of anti-infectious immunity was 19.0 per cent and 4.7 per cent. Unvaccinated controls aborted at the rate of 81.8 per cent with the lower infective dose, while 100 per cent aborted with the higher dose. The author believes that the more advanced pregnancy stage of the animals vaccinated with strain "B" at the time of exposure could be of significance in the results attained. The use of the nonagglutinogenic vaccine is suggested because no post-vaccination agglutinins interfere in the prophylaxis.—[*Francisco Sieiro: New Studies on Comparative Brucella Immunity with Agglutinogenic and Nonagglutinogenic Vaccines. Am. J. Vet. Res., 15, (July, 1954): 417-424.*]

Serodiagnosis of Bovine Leptospirosis

A combination of the capillary tube test and a newly developed plate test was used in the examination of 7,066 bovine serums for antibodies against *Leptospira pomona.* Serums utilized in the study had been submitted for test for brucellosis to federal or state laboratories in Oregon, Washington, Idaho, and Montana.

With the exception of minor changes, antigens were prepared according to a method previously described.[1] The density of plate antigens was standardized by serological and colorimetric means. By the use of properly standardized antigens in the plate-screen test, weakly positive and strongly positive serums could be identified with equal certainty.

The plate-screen test was employed to classify serums rapidly into positive and negative categories. With a calibrated loop or appropriately graduated pipette, 0.005 ml. of serum was deposited on a glass plate. A drop of antigen was added to the serum and the preparation mixed with an applicator stick, then incubated at room temperature for six minutes. The plate was then rotated for two, half-minute periods (about 30 times per minute), so that a portion of the mixture followed the entire periphery of the drop. Agglutinated leptospiras are best detected by examining the drops in a nondiffused beam of light from a Spencer-type microscope lamp directed obliquely through the plate. Strongly positive serums usually cause good agglutination after the first half minute of rotation, whereas a full minute of turning is required for weakly positive serums.

The titer of serums positive on the plate-screen test was determined by the capillary tube method.[1] Serums which were positive after the first half minute of rotation were tested in final fourfold dilutions of 1:10 through 1:640. Serums which required a full minute of rotation to effect agglutination were examined only in dilutions of 1:10 and 1:40 by the capillary tube method. For use in the capillary tube test, two parts of plate antigen were diluted with one part of antigen diluent.

The titer of positive serums can be ascertained also by a rapid-plate method. As fourfold serial dilutions of serum are prepared, 0.03 ml. of each dilution is deposited on a glass plate, and a drop of antigen is added to each serum dilution. After stirring, the mixtures are incubated for six minutes. The plate is then rotated for one minute and the reactions read. With bovine serums which contain type-specific antibodies against the species incorporated in the antigen, titers are usually equal by both techniques or may vary within one dilution of each other.

From seven representative herds infected with *L. pomona,* 504 serums were examined also by the agglutination-lysis technique. Most of the serums positive at 1:40 dilution in the capillary tube test possessed titers of 1:100 to 1:500 in the agglutination-lysis test. The majority of serums positive at 1:160 reacted at titers of 1:5,000 to 1:500,000 in the agglutination-lysis test, whereas most of the specimens positive at 1:640 or greater possessed a titer of 1:500,000 or greater when examined by the agglutination-lysis method. In the classification of serums as either positive or negative, agreement between the two tests was 96 per cent.

Because some 1:40 reactions may be nonspecific in nature, herds were classed as negative if they contained only a few animals with this titer. Reactions at dilutions of 1:160 or greater were considered specific and reflected previous experience with *L. pomona.*

Serological evidence of infection with *L. pomona* among cattle was found in all four states surveyed. The disease occurred chiefly among herds of beef cattle. It was particularly prevalent in certain areas in Idaho, Oregon, and Washington. Abortion, febrile anemia, and hemoglobinuria were prominent symptoms. Of the herds tested, 13 per cent contained serologically positive cattle, but since many serums originated from brucellosis-free herds in which abortions had occurred, the sampling was biased; therefore, the true prevalence of infection was much lower than the data indicate. Abortions in as many as 40 per cent of the pregnant females may occur in affected herds, usually in the third, but also during the second, trimester of gestation. Characteristic of such cases are an edematous umbilical cord severed close to the fetus and tightly retained placentas.—[*Herbert G. Stoenner: Application of the Capillary Tube Test and a Newly Developed Plate Test to the Serodiagnosis of Bovine Leptospirosis. Am. J. Vet. Res., 15, (July, 1954): 434-439.*]

This work was done at the U. S. Department of Health, Education, and Welfare, Public Health Service, Communicable Disease Center, Atlanta, Ga., and National Institutes of Health, National Microbiological Institute, Rocky Mountain Laboratory, Hamilton, Mont. Dr. Stoenner's present address is CDC Activities, Division of Dairy and Livestock, Department of Agriculture, Olympia, Wash.

[1]Stoenner, H. G.: A Capillary-Tube Test for Leptospirosis. Am. J. Hyg., 57, (May, 1953): 316-327.

Electrophoretic Study of the Horse Serum of Equine Infectious Anemia

The albumin-globulin ratio (A/G ratio) decreases progressively in equine infectious anemia serum as the disease proceeds to the chronic form. This confirms Gilman's study by the chemical method. The experiment shows a decrease of the A/G ratio, which is caused by a relative increase of γ-globulin as in the acute case of equine infectious anemia, and a definite increase of γ-globulin and a decrease of albumin as in the chronic form of equine infectious anemia. The A/G ratio calculated from the 26 per cent Na_2SO_4 precipitation method does not parallel that calculated from the electrophoretic pattern.—[*Kung Ying Tang Kao, Reginald L. Reagan, and A. L. Brueckner: Electrophoretic Study of the Horse Serum of Equine Infectious Anemia. Am. J. Vet. Res., 15, (July, 1954): 343-345.*]

Metopon Analgesia in the Dog

Pain threshold studies were conducted on 100 dogs of various sizes, ages, and breeds to determine (*a*) optimal canine dose of metopon, (*b*) tolerance, and (*c*) effect on temperature, pulse rate, and respiratory rate. Comparisons are made between the actions of metopon and morphine. The optimal analgesic dose of metaphon in the dog, as determined in this study, is 4.0 mg. per kilogram of body weight. Metopon analgesia persisted in these animals for an average of five and six-tenths hours with the optimal dose. Tolerance to repeated injections seemed to occur rapidly in the dog. Results indicated that metopon analgesia for dogs has two advantages as compared with morphine: (1) rapidity of action, and (2) persistence of analgesia. This drug appears to have potential value as an analgesic for dogs.—[*Glenwood P. Epling and A. Donald Rankin: Metopon Analgesia in the Dog. Am. J. Vet. Res., 15, (July, 1954): 338-342.*]

Enterotoxemia Immunity in Lambs

Lambs 15 days old were immunized with toxoids prepared from *Clostridium perfringens epsilon* prototoxin and toxin. Four weeks after immunization, the lambs receiving the prototoxin-toxoid had an average titer of 1.11 units per milliliter; those receiving the toxin-toxoid had an average titer of 7.77 units per milliliter. Eighteen weeks after immunization, all lambs were injected with toxin-toxoid and bled one week later. The lambs originally immunized with prototoxin-toxoid had an average titer of 52 units per milliliter; those immunized with toxin-toxoid, an average titer of 544 units per milliliter. Conversion of the prototoxin to the toxin appears to be advisable in preparing immunizing agents.—[*Louis DS. Smith and Tats Matsuoka: A Comparison of Clostridium Perfringens Epsilon Toxin-Toxoid and Prototoxin-Toxoid in the Immunization of Young Lambs. Am. J. Vet. Res., 15, (July, 1954): 361-363.*]

Tocopherol Deficiency in Young Calves

Signs typical of those observed in field cases of the skeletal type of "white muscle disease" were produced in calves fed a "synthetic milk" ration deficient only in vitamin E (*alpha*-tocopherol). Posture maintenance, locomotion, and nursing showed a progressive weakness. Bilaterally symmetrical pairs of muscles were involved. Dystrophic lesions were manifested macroscopically by whiteness and microscopically by fragmentation and hyalinization of the muscle fibers, accompanied by extensive nuclear invasion. Deviation of the heart action from normal was slight and heart lesions were not discernible macroscopically or microscopically. Neither creatinuria nor other urinary changes were symptomatic in these cases, and no cytological or chemical changes in the blood, other than absence of tocopherol, were detected. Tocopherol supplementation at the time of extreme muscular weakness resulted in immediate and nearly complete recovery.—[*J. W. Safford, K. F. Swingle, and H. Marsh: Experimental Tocopherol Deficiency in Young Calves. Am. J. Vet. Res., 15, (July, 1954): 373-384.*]

Studies of Ketosis in Dairy Cows

In normal cows, an increased blood glucose was maintained for about three to four hours when 250 Gm. of glucose was injected intravenously, whereas it was maintained for sixteen to twenty-four hours when a combination of 250 Gm. of glucose and 50 U.S.P. units of ACTH was injected. The intramuscular injection of 200 to 600 units of ACTH produced, in twenty-four hours, a marked increase in blood sugar but a sharp drop in milk production and in the eosinophil count in both normal and ketotic cows.—[*J. C. Shaw, R. E. Brown, R. A. Gessert, and A. C. Chung: Studies on the Etiology and Treatment of Ketosis in Dairy Cows. J. Dai. Sci., 37, (1954): 661.*]

Electrocardiograms of the Dog

The normal canine electrocardiogram was determined through studies on 50 apparently normal dogs. These findings did not differ greatly from other findings on the electrocardiograms of the dog previously established. The influence of nephritis, nephrosis, and uremia on the electrocardiogram was determined by studying the electrocardiograms of 25 cases of clinically diagnosed nephritis, nephrosis, and/or uremia. The indications appeared to be that the alterations of serum electrolytes occurring in renal abnormality, and especially the potassemia that usually results, cause a prolongation of the Q-T interval and peaking of the T waves of the electrocardiogram and a bradycardia.—[*O. A. Soave: Clinical Electrocardiograms of the Dog. Am. J. Vet. Res., 15, (July, 1954): 336-337.*]

Life History of Cooperia Punctata

Four species of Cooperia occur in domestic ruminants, 1 in sheep and 3 in cattle. Of the latter, *Cooperia punctata*, which is common throughout the country, has a high pathogenic potential. The life cycle, not previously ascertained, is as follows: the light brown-colored eggs are passed in the host's feces in the 16-cell stage; the first-stage larvae hatch in twenty hours, at 68 to 90 F., and molt thirty hours after hatching; second-stage larvae, averaging 798 μ in length, emerge ninety-six hours after hatching; after being ingested by a susceptible calf, they develop into third-stage larvae in twenty-four hours, reaching the fourth stage at the end of the fourth day after ingestion. By the tenth day after ingestion, the nematodes are nearly mature and are forming ova.—[*T. Bonner Stewart: The Life History of Cooperia Punctata, a Nematode Parasitic in Cattle. J. Parasitol., 40, (June, 1954): 321-326.*]

Transmission of Ovine Vibriosis

Two experiments are reported which confirm the conclusion from field observations that ewes infected with *Vibrio fetus* do not retain the infection from one season to the next and, therefore, do not act as carriers. In one experiment, 50 yearling ewes from a clean flock were bred, wintered, and lambed with 42 ewes which had aborted as the result of vibriosis the previous season. Vibriosis did not develop in any of the exposed yearlings, and no evidence of the presence of *V. fetus* was found in the previously infected ewes.—[*H. Marsh, B. D. Firehammer, and L. H. Scrivner: The Negative Role of the Ewe in the Transmission of Vibriosis of Sheep. Am. J. Vet. Res., 15, (July, 1954):* 352-355.]

Foot-and-Mouth Disease Research

In the mass production of foot-and-mouth disease virus *in vitro,* in which epithelial tissue from bovine tongues forms a part of the medium, tests have shown that fine mincing of the epithelial tissue is unnecessary.—[*H. S. Frenkel: Research on Foot-and-Mouth Disease. VII. Cultivation of the Virus on a Practical Scale in Explantations of Tongue Epithelium—A Modification of the Culture Technique. Am. J. Vet. Res., 15, (July, 1954):* 346-348.]

Response of Various Animals to Vesicular Stomatitis

The level of the serum-neutralizing antibodies after artificial exposure to vesicular stomatitis virus was studied in the horse, cow, pig, goat, sheep, dog, rabbit, guinea pig, ferret, hamster, chinchilla, and chicken. An anamnestic response to subsequent infection after two weeks was also considered in this study. The titer of neutralizing antibodies, as well as the anamnestic response, did not appear to represent an index of the resistance or susceptibility of a given species.—[*T. Kowalczyk and C. A. Brandly: Susceptibility and Serological Response of Various Species of Animals to Infection with the Virus of Vesicular Stomatitis. Am. J. Vet. Res., 15, (July, 1954):* 477-480.]

Effects of Dietary Deficiencies on Electrocardiograms of Chickens

Adult Barred Plymouth Rock hens were fed rations deficient in vitamin E and certain B complex vitamins, vitamin E alone, and B complex vitamins alone for approximately seven to nine months.

Vitamin E deficiency alone did not affect egg production or mortality appreciably, but it did produce abnormal electrocardiograms in a considerable number of birds.

When the rations were deficient in vitamins E and B complex, the mortality was slightly higher in some groups but egg production was not affected.

The incidence of heart disorders for birds depleted of vitamins E and B complex was no greater than for those depleted of B or E vitamins alone, but the type of anomalies differed somewhat. Right axis deviation was rare in the birds fed the ration deficient in B vitamins alone, but it was common in the vitamin E-depleted, and vitamin E- and B-depleted groups. The principal abnormalities of vitamin E-deficient hens included right axis deviation, premature, ventricular systoles, sinus arrhythmia, and elevated S-T segments. Sinus arrhythmia, *per se,* is not considered abnormal in some mammals and in the pigeon, but it occurs rarely in normal chickens.—[*Paul D. Sturkie, E. P. Singsen, L. D. Matterson, Anna Kozeff, and E. L. Jungherr: The Effects of Dietary Deficiencies of Viatmin E and the B Complex Vitamins on the Electrocardiogram of Chickens. Am. J. Vet. Res., 15, (July, 1954):* 457-462.]

FOREIGN ABSTRACTS

Nitrofurazone for Eimeria Infection

The mortality (54%) in chickens, after infection with *Eimeria tenella,* could be reduced to 12 per cent by prophylactic application of nitrofurazone (0.0055%) in the ration, administered as "N.F.Z." mix; a second experiment confirmed these results. The mortality observed in the control groups was 20 per cent and 68 per cent; in treated groups, 0 to 6 per cent. Increasing the concentration of nitrofurazone to 0.0082 per cent did not result in sufficient improvement to make this increase advisable, the mortality of these treated groups amounting to 0 to 4 per cent compared with 40 and 80 per cent in the groups not treated. Growth-stimulating effects of nitrofurazone were not observed.—[*F. C. Kianeveld, L. de Blieck, T. J. de Man, and N. Ziwiep: Nitrofurazone as a Prophylactic Against Eimeria Tenella Infection. Tijdschr. voor Diergeneesk., 79, (1954):* 336-337.]—L.V.E.

Acute Pancreas Necrosis in Swine

The author describes a case of acute pancreas necrosis in a pig with serious clinical symptoms. As a result of the histological examination, the writer believes that this illness can be compared with the "human" Balser's necrosis.—[*A. W. A. Bos: Acute Hemorrhagic Pancreatitis. Tijdschr. voor Diergeneesk., 79, (1954):* 246-253.]—L.V.E.

Strychnine Poisoning in the Dog

Dogs which have taken strychnine either do not vomit or do so much too late. If cramps have occurred, the emetic effect of apomorphine is often disappointing. In literature, intravenous injection of a barbiturate is mentioned but is not

sufficiently emphasized. According to the author, this therapy combined with apomorphine deserves priority in all cases in which cramps have already occurred, since it changes the prognosis from doubtful to favorable. Two cases are described in which the course of the disease took a favorable turn some minutes after the intravenous injection of the barbiturate.—[*M. A. J. Verwer: The Treatment of Strychnine Poisoning in the Dog. Tijdschr. voor Diergeneesk., 79, (1954): 260-265.*]—L.V.E.

Testosterone to Prevent Cortisone-Induced Adrenocortical Atrophy

Atrophy of the adrenal cortex following prolonged use of cortisone is a serious limiting factor. It has been found that when patients receiving long courses of the hormone are subjected to surgical interventions, or when they contract even minor infectious diseases, they are unable to cope with the additional stress and many of them succumb unless immediate measures are taken. Turiaf and co-workers have made a great contribution to clinical medicine by the discovery that a weekly injection of 25 mg. of testosterone will prevent atrophy of the adrenal cortex in patients receiving continuous cortisone therapy. With wider use of cortisone in small animal practice, especially in older arthritic dogs, this fact will find application. —[*J. Turiaf et al.: Presse Med. (June 10, 1953): 825 (abstr. in Q.S., Abreges Mensuels du Practicien Moderne. No. 1, Vol. 5, 1954).*]—R.F.V.

Colchicine in the Treatment of Warts

The authors report the successful use of colchicine in the treatment of stubborn warts that keep returning after conventional therapy. Colchicine, 1 mg., is dissolved in 1 cc. of normal saline solution and this is injected directly into the base of the wart and into its body. The wart dries up and within one week it can be detached easily and will not recur.—[*A. Legros and L'Heureaux: Le Traitement des Verues Vulgaires par l'injection de Colchicine. Arch. Belges Dermat. & Syph. (Nov., 1952): 368.*]—R.F.V.

Genital Tuberculosis in the Cat

A case of tuberculosis of the genitalia in a male cat is reported. The authors state that it has been observed in the female also, infecting the uterus and causing a tuberculous metritis. Numerous organisms can be discharged in this condition. The infected male can transmit the infection during coitus. Thus, 1 male cat can be the source of a considerable amount of spread. Early diagnosis is difficult. Female cats have a light mucosanguineous discharge but in males it is difficult to recognize early cases. Generally speaking, there is an accompanying orchitis.

Surgical correction is not practical because the infection is generalized by the time it is recognized. It is the opinion of the authors that most cats become infected as a result of eating wastes from slaughterhouses; thus, the infection is primarily one of the digestive system which is carried to the reproductive organs via the blood stream. —[*V. Robin and M. Fontaine: Tuberculosis Tuberculose Genitale du Chat. Rec. Méd. Vét. (April, 1954): 213-216.*]—R.F.V.

Fig. 1—Tuberculous organs of cats: (1) spleen; (2) rectum and anal glands; (3) testicle.

BOOKS AND REPORTS

The Anatomy of the Domestic Animals

The fourth, revised edition of "The Anatomy of the Domestic Animals" is a classic in veterinary literature. The arrangement of the book along divisions of systematic anatomy is unchanged. The introduction is enlarged to include descriptive terms.

The section pertaining to the osteology of the horse is rearranged upon an axial, appendicular skeletal basis to enable the student to use the text more efficiently.

Several helpful diagrams dealing with the stay apparatus were added to the section of myology. A number of new figures was added to the sections dealing with the digestive system of the horse, ox, sheep, and dog. An additional figure was added to the genital system of the ox and one to that of the chicken.

The major criticism which the reviewer would make is the absence of any enlargement of the sections dealing with the anatomy of the ox and dog. Despite these omissions, the book should be a must for all veterinary students as well as graduate veterinarians.—[*The Anatomy of the Domestic Animals. By S. Sisson and J. D. Grossman. 4th ed. 972 pages. Illustrated. W. B. Saunders Co., Philadelphia, Pa. 1953. Price $15.00*]—ROBERT W. DAVIS.

THE NEWS

Drs. R. S. Sugg and F. J. Kingma Elected in Executive Board Districts IV and X

As a result of the election completed in Executive Board District IV late in July, Dr. Redding S. Sugg, incumbent, Auburn, Ala., was re-elected for a five-year term to represent his district which comprises Alabama, Cuba, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Puerto Rico, South America, Tennessee, Virginia, West Indies, and West Virginia. This will be Dr. Sugg's second term on the Board, he having been elected first in 1949 for the term which expired this year.

In District X (Michigan and Ohio), Dr. Fred J. Kingma, Columbus, Ohio, was elected for a five-year term which began at the conclusion of the annual meeting in Seattle. He succeeds Dr. Walter R. Krill who had served previous terms (1944 to 1949 and 1950 to 1954) and who announced, prior to the nominating elections in the district, that he would not be a candidate.

Dr. Sugg is dean of the School of Veterinary Medicine, Alabama Polytechnic Institute, and Dr. Kingma is chairman and professor of veterinary physiology and pharmacology, College of Veterinary Medicine, Ohio State University.

Foreign Veterinary Colleges Evaluated by the AVMA Council on Education

The Council on Education of the American Veterinary Medical Association recommends that veterinary institutions and organizations in the United States and Canada consider all past and current graduates of the following listed foreign veterinary colleges on an equal basis with graduates of approved veterinary colleges in the United States and Canada.

Inclusion of a foreign veterinary college in this list does not constitute official accreditation or approval by the Council on Education of the American Veterinary Medical Association since its jurisdiction is limited to the United States and Canada.

This list of recognized foreign veterinary colleges is published for advisory purposes only. It is a partial list and will be augmented and revised at such times as additional data are obtained and evaluated by the Committee on Foreign Veterinary Colleges of the Council on Education. Omission of the name of a foreign veterinary college from the list should not be interpreted as disapproval of that college; but in many instances indicates that the data available on that college is insufficient or too incomplete to permit an accurate evaluation.

Publication of the following list was authorized at the meeting of the Council on Education on May 25, 1953. The list supersedes that previously published in the JOURNAL (March, 1954: 239 and 241).

1) *Australia*
   Veterinary College, University of Sydney.
2) *Austria*
   The Vienna Veterinary College, Vienna (for graduates in 1952 and years subsequent thereto).
3) *British Isles*
   Members of the Royal College of Veterinary Surgeons* who are graduates of only the following named colleges:
   a) The Royal Veterinary College, London and Streatley.
   b) The Royal (Dick) Veterinary College, Edinburgh.
   c) The Glasgow Veterinary College, Glasgow.
   d) The Veterinary College of the University of Liverpool.
   e) The Royal Veterinary College of Ireland, Dublin.
4) *Denmark*
   Royal Veterinary Agricultural College, Copenhagen.
5) *France*
   a) National Veterinary College at Alfort, Alfort.
   b) National Veterinary College of Lyon, Lyon.
   c) National Veterinary College at Toulouse, Toulouse.
6) *Germany*
   a) Justus Liebig Veterinary College, Giessen (for graduates in 1953 and in years subsequent thereto; *see* also *"e"* under *Germany* on page 258).
   b) Hannover Veterinary College, Hannover (for graduates in 1950 and in years subsequent thereto).
   c) Veterinary College, Bavarian Ludwig-Maximilian University, Munich (for graduates in 1953 and in years subsequent thereto; *see* also *"d"* under *Germany* on page 258).
7) *Netherlands*
   Royal University of Utrecht, Utrecht.
8) *Norway*
   Royal Veterinary College, Oslo.

(Continued on page 258)

***The Royal College of Veterinary Surgeons is not a college in the sense in which the term is used in North America. It is a licensing agency chartered by the government to which members are admitted only after having graduated from approved veterinary colleges and after having passed veterinary professional examinations.**

News From Washington

The President, on July 22, 1954, nominated Col. Elmer W. Young, V.C., for promotion to the permanent grade of Brigadier General, Veterinary Corps, U. S. Army.

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The Senate Finance Committee has reported out HR 936 (social security amendments, 1954), **excluding self-employed professional persons from coverage.** Should the Senate pass this bill as reported by the Committee, it would necessitate a conference as the House-approved measure excluded only physicians.

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Senator Saltonstall, for himself and 11 other Senators, introduced S-3726 on July 9, 1954. This bill would grant the consent of Congress to **certain New England States to enter into a compact to provide greater educational opportunities and services.** The aim of the bill is to further higher education in the fields of medicine, dentistry, veterinary medicine, and public health. A similar bill (HR 9712) has been favorably reported by the House Education Committee.

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The Department of Defense recently announced plans to utilize to a limited extent the **inspection and grading services of the Department of Agriculture in the origin-procurement inspection of** meat, meat products, and dairy products for the Armed Forces.

Origin-procurement inspection of these products is a responsibility of the Army and Air Force Veterinary Corps; however, in keeping with current economy of military manpower, a decision was made to utilize to the maximum extent practicable the services of the Department of Agriculture consistent with the military program. **The extent of such utilization was based upon the mobilization requirements of the respective services** and the retention of a training base in this particular field of inspection to support current oversea operations where large quantities of subsistence are being purchased from indigenous sources.

As a result of a recent study of this matter by the Department of the Army, it was determined that the inspection responsibility in approximately 150 plants located in various sections of the United States could be transferred to the Department of Agriculture without adversely affecting military requirements. The Army's purchases of meat and meat products are limited to establishments operating under the supervision of the Meat Inspection Branch, U.S.D.A., of which there are approximately 1,100 such establishments in the United States at this time. **The transfer of this responsibility is to be accomplished gradually** so that U.S.D.A. personnel may familiarize themselves with Armed Forces inspection procedures and to permit adjustments in military personnel. The dates of transfer agreed upon were July 1, August 1, September 1, and October 1, 1954.

Early press releases have, in some instances, created an impression that **all** Armed Forces food inspection responsibilities were being assigned to the U.S.D.A., and failed to indicate the extent of the transfer or to specifically identify the type of inspection involved or the commodity groups affected.

That portion of origin-procurement inspection being assigned to the U.S. Department of Agriculture which involves the **inspection of meat and meat products will be performed by the Meat Inspection Branch,** Agricultural Research Service. That portion of origin-procurement inspection being assigned to the U.S.D.A. which involves **dairy products** will be **performed by the Dairy Division,** Agricultural Marketing Service.

AVMA Office Address in Washington

Brig. General James A. McCallam (Ret.)
Room 109, 1507 M Street, N.W.
Washington 5, D. C.

(Continued from page 256)

9) *South Africa*
University of Pretoria (formerly Transvaal University), Onderstepoort.

10) *Sweden*
Royal Veterinary College, Stockholm.

The following veterinary colleges had distinguished faculties and maintained high standards prior to 1939. The Council recommends that graduates of the following colleges during and prior to 1939 be accorded the same recognition as graduates of the colleges named above.

1) *Austria*
a) Vienna Veterinary College, Vienna.

2) *Germany*
a) Freiderick-Wilhelm's University, Berlin.
b) Hannover Veterinary College, Hannover.
c) University of Leipzig, Leipzig.
d) Bavarian Ludwig-Maximilian University, Munich.
e) Justus Liebig College for Agriculture and Veterinary Medicine, Giessen.

3) *Hungary*
Hungarian University of Agricultural Sciences, Budapest.

WOMEN'S AUXILIARY

Kansas City Auxiliary.—At the July 20 meeting of the Women's Auxiliary to the Kansas City Veterinary Medical Association, Mrs. Rudolph de Bell, a native of Holland, discussed life and customs in the Netherlands, with particular emphasis on special occasions such as holidays. Members also enjoyed cards and visiting.

s/MRS. K. M. CURTS, *Secretary.*

APPLICATIONS

Applicants — Members of Constituent Associations

In accordance with paragraph (b) of Section 2, Article X, of the Administrative By-Laws, as revised at the annual meeting of the House of Representatives, Aug. 18, 1951, in Milwaukee, Wis., the names of applicants residing within the jurisdictional limits of the constituent associations shall be published once in the JOURNAL.

The following applicants have been certified as members of the constituent association that has jurisdiction over the area in which the applicant resides. This certification was made by the secretary of the constituent association in accordance with Section 2, Article X, of the Administrative By-Laws.

EVANS, GEORGE A.
1003 Central Ave., E., Clarion, Iowa.
D.V.M., Iowa State College, 1920.

HATTON, ERNEST E.
Orwell, Ohio.
D.V.M., Ohio State University, 1917.

POTTEIGER, ROBERT J.
601 N. Market St., Selinsgrove, Pa.
V.M.D., University of Pennsylvania, 1918.

SCHOEL, GEORGE E.,
Box 194, State Center, Iowa.
D.V.M., Iowa State College, 1951.

SHIFFMAN, MORRIS A.
Wissahickon Gardens, Philadelphia, Pa.
D.V.M., Alfort National Veterinary School, France, 1949.

STREETS, JAMES E.
1210 Front St., Lynden, Wash.
D.V.M., Washington State College, 1950.

Applicants — Not Members of Constituent Associations

In accordance with paragraph (b) of Section 2, Article X, of the Administrative By-Laws, as revised at the annual meeting of the House of Representatives, Aug. 18, 1951, in Milwaukee, Wis., notice of all applications from applicants residing outside of the judisdictional limits of the constituent associations, and members of the Armed Forces, shall be published in the JOURNAL for two successive months. The first notice shall give the applicant's full name, school, and year of graduation, post office address, and the names of his endorsers.

First Listing

HERRERA S., HUMBERTO
Manuel Candamo 166, Lima, Peru.
D.V.M., National University of San Marcos, Peru, 1952.
Vouchers: T. Ramos and R. E. Bardwell.

Second Listing

MCPEEK, RAYMOND C., Blairstown, N. J.
REISINGER, ROBERT C., 56 N. W. 102nd St., Miami, Fla.

1954 Graduate Applicants

The following are graduates who have recently received their veterinary degree and who have applied for AVMA membership under the provision granted in the Administrative By-Laws to members in good standing of student chapters. Applications from this year's senior classes not received in time for listing this month will appear in later issues. An asterisk (*) after the name of a school indicates that all of this year's graduates have made application for membership.

First Listing

Alabama Polytechnic Institute

BLOXHAM, JOHN C., D.V.M.
2305 Blossom St., Columbia, S. Car.
Vouchers: B. F. Hoerlein and M. Heath.

University of California

BAKER, HAROLD R., D.V.M.
5116 Miriam St., Los Angeles, Calif.
Vouchers: E. A. Rhode and J. D. Wheat.

CLINKENBEARD, CHARLES R., D.V.M.
P. O. Box 185, Yuba City, Calif.
Vouchers: J. A. Howarth and C. E. Cornelius.

DILLON, ROY, D.V.M.
Rt. 1, Box 100A, Davis, Calif.
Vouchers: J. F. Christensen and B. V. Lundberg.

ENDERS, FRANK G., D.V.M.
1161 Irwin Lane, Santa Rosa, Calif.
Vouchers: T. J. Hage and A. R. Greenwood.

FELDMANN, ANTHONY W., D.V.M.
5224 Vineland Ave., North Hollywood, Calif.
Vouchers: J. F. Christensen and T. J. Hage.

FROST, CLIFFORD A., D.V.M.
c/o Dr. Walter W. Weller, Highway 66, Ashland, Ore.
Vouchers: T. J. Hage and E. A. Rhode.

GARIBALDI, JERRY F., D.V.M.
1124 S. Main St., Salinas, Calif.
Vouchers: E. A. Rhode and T. J. Hage.

LECK, ARTHUR A., D.V.M.
2515 E. 73rd Pl., Chicago, Ill.
Vouchers: E. A. Rhode and J. D. Wheat.

MCDANIEL, GEORGE E., JR., D.V.M.
4329 Hilts Ave., Sacramento, Calif.
Vouchers: T. J. Hage and G. D. Pettit.

MARTIN, WILLIAM L., D.V.M.
Rt. 2, Pearson Rd., Paradise, Calif.
Vouchers: J. F. Christensen and G. D. Pettit.

MURRAY, HOWARD W., D.V.M.
193 So. Montgomery St., Napa, Calif.
Vouchers: T. J. Hage and J. F. Christensen.

RIGGS, WILLIAM F., D.V.M.
1332 135th Ave., San Leandro, Calif.
Vouchers: T. J. Hage and J. F. Christensen.

SIMMONS, GORDON T., D. V. M.
308 Springs Rd., Vallejo, Calif.
Vouchers: T. J. Hage and G. D. Pettit.

STOUFER, ROBERT M., D.V.M.
2037 East Street, Redding, Calif.
Vouchers: T. J. Hage and E. A. Rhode.

THOMAS, JAMES P., JR., D.V.M.
4033 43rd St., San Diego, Calif.
Vouchers: E. A. Rhode and T. J. Hage.

TOBIAS, EUGENE W., D.V.M.
452 Corte Maria Ave., Chula Vista, Calif.
Vouchers: J. D. Wheat and T. J. Hage.

YOUNG, DEAN C., D.V.M.
c/o Emmet E. Young, P. O. Box 92, Winters, Calif.
Vouchers: B. McGowan, Jr. and E. A. Rhode.

Colorado A. & M. College

TAYLOR, DEE O. N., D.V.M.
1076 S. W. 3rd Ave., Ontario, Ore.
Vouchers: F. S. Scott and L. K. Wayt.

University of Illinois

DEES, DENZIL E., D.V.M.
2016 Boudreau Dr., Urbana, Ill.
Vouchers: J. Sampson and R. G. Link.

FEHRENBACHER, WALTER L., D.V.M.
Pittsfield, Ill.
Vouchers: L. E. Boley and A. G. Schiller.

FOLKERTS, THOMAS M., D.V.M.
R. R. 1, Lincoln, Ill.
Vouchers: L. R. Bain and R. D. Hatch.

GUNHOUSE, THOMAS J., D.V.M.
P. O. Box 236, Frankfort, Ill.
Vouchers: L. E. Boley and R. E. Witter.

SCHLAPP, JEWELL D., D.V.M.
Box 352, Yorkville, Ill.
Vouchers: R. D. Hatch and R. E. Witter.

SHINN, EDWARD M., D.V.M.
423 E. Wall, Moweaqua, Ill.
Vouchers: R. D. Hatch and A. G. Schiller.

SPESARD, STANLEY R., D.V.M.
324 E. Main St., Shelbyville, Ill.
Vouchers: R. D. Hatch and L. R. Bain.

Iowa State College

BRANAMAN, EDWIN W., D.V.M.
Larchmont Ave., Bellwick Acres, Harrodsburg, Ky.
Vouchers: F. K. Ramsey and I. A. Merchant.

FRYE, GRANVILLE H., D.V.M.
Graettinger, Iowa.
Vouchers: E. A. Benbrook and C. H. Covault.

HENSLEY, ROBERT M., D.V.M.
126½ Barberry Lane, Lexington, Ky.
Vouchers: G. R. Fowler and C. H. Covault.

YODER, HARRY W., JR., D.V.M.
R. R. 1, Mount Morris, Ill.
Vouchers: D. F. Stevens and I. A. Merchant.

Michigan State College

AUVIL, JAMES D., D.V.M.
424 Chestnut St., Parsons, W. Va.
Vouchers: G. R. Moore and G. H. Conner.

BALDWIN, PETER C., D.V.M.
1634 Cedar, Niles, Mich.
Vouchers: G. R. Moore and E. A. White.

BECK, CLIFFORD C., D.V.M.
1434 Virginia St., Racine, Wis.
Vouchers: W. O. Brinker and H. P. Eames.

BENSON, CHARLES D., D.V.M.
Rt. 1, Box 197, Lansing, Mich.
Vouchers: W. F. Keller and R. G. Schirmer.

BERGMAN, GEORGE A., D.V.M.
Diamond Lake, Cassopolis, Mich.
Vouchers: E. K. Sales and W. O. Brinker.

BOSCHULT, HERALD H., D.V.M.
939 Main St., Crete, Ill.
Vouchers: W. F. Riley, Jr. and R. G. Schirmer.

BOYER, LOUIS W., D.V.M.
Rt. 1, Custer, Mich.
Vouchers: D. E. Gray and D. E. Bloomquist.

BREKKE, EUGENE, D.V.M.
1002 4th Ave., Stevens Point, Wis.
Vouchers: R. L. Mowry and G. H. Conner.

BRENGLE, LARRY A., D.V.M.
60001 — 8 Mile Rd., South Lyon, Mich.
Vouchers: G. R. Moore and G. H. Conner.

CATHEY, JOYCE L., D.V.M.
15521 Jackson Rd., Manchester, Mich.
Vouchers: W. O. Brinker and H. P. Eames.

CHOLVIN, NEAL R., D.V.M.
430 N. Irwin St., Hanford, Calif.
Vouchers: E. K. Sales and W. F. Riley, Jr.

CLARK, HOLLIS H., JR., D.V.M.
2601 E. Michigan Ave., Lansing, Mich.
Vouchers: G. R. Moore and E. K. Sales.

CROXTON, DALE E., D.V.M.
R. R. 4, Box 123, c/o Walter Stinson, Anderson, Ill.
Vouchers: G. R. Moore and E. K. Sales.

CRUICKSHANK, GEORGE, D.V.M.
23806 Cushing Ave., East Detroit, Mich.
Vouchers: E. K. Sales and G. H. Conner.

DEWEERD, KENNETH N., D.V.M.
420 S. Main St., Wayland, Mich.
Vouchers: G. H. Conner and W. O. Brinker.

DOBIAS, ALBERT, D.V.M.
Machinaw Ave., Cheboygan, Mich.
Vouchers: A. R. Drury and G. H. Conner.

ELBING, RAYMOND H., D.V.M.
3911 Lilac, Lansing, Mich.
Vouchers: L. B. Sholl and R. A. Runnells.

EPSTEIN, DAVID I., D.V.M.
1817 Church St., Evanston, Ill.
Vouchers: A. C. Wheeler and R. D. Barner.

GEARHART, LAWRENCE W., D.V.M.
212 E. 7th St., Holland, Mich.
Vouchers: W. O. Brinker and R. G. Schirmer.

GLEEMAN, ALLEN I., D.V.M.
116 Poplar St., Roselle, N. J.
Vouchers: W. O. Brinker and R. G. Schirmer.

HALL, ARTHUR E., D.V.M.
Box 44, Garrett, Ind.
Vouchers: W. O. Brinker and R. G. Schirmer.

HANNA, H. DWIGHT, D.V.M.
Case and Monroe Sts., Kinmundy, Ill.
Vouchers: W. F. Riley, Jr., and G. H. Conner.

HERBERT, WARD V., D.V.M.
14098 Turner Rd., Dewitt, Mich.
Vouchers: R. G. Schirmer and M. E. Kimball.

KEARNS, RICHARD J., D.V.M.
124 Derby St., Hingham, Mass.
Vouchers: R. G. Schirmer and W. O. Brinker.

LINDSAY, RICHARD D., D.V.M.
21 Lincoln Circle, Andover, Mass.
Vouchers: A. C. Wheeler and R. G. Schirmer.

MCCLARNON, GEORGE S., D. V. M.
1003 D Birch Rd., East Lansing, Mich.
Vouchers: E. K. Sales and R. D. Barner.

MEDLOCK, JOHN F., D.V.M.
1901 13th St., Bedford, Ind.
Vouchers: E. K. Sales and G. P. White.

MEDLOCK, ROBERT W., D.V.M.
R. R. 4, c/o O. F. Hammond, Bedford, Ind.
Vouchers: E. K. Sales and R. D. Barner.

MIEDEMA, GERALD J., D.V.M.
3021 Jefferson Ave., S. E., Grand Rapids, Mich.
Vouchers: R. G. Schirmer and L. B. Sholl.

MILLER, NORMAN R., D.V.M.
R. R. 4, Muncie, Ind.
Vouchers: L. B. Sholl and A. C. Wheeler.

MITCHELL, GERALD D., D.V.M.
316 Helen Ave., Trenton, Mich.
Vouchers: G. H. Conner and W. F. Keller.

PARKER, JOHN D., D.V.M.
R. R. 1, Woodburn, Ind.
Vouchers: W. F. Riley, Jr., and G. H. Conner.

PEARSON, ROBERT E., D.V.M.
1490 E. Cook Rd., Grand Blanc, Mich.
Vouchers: E. K. Sales and R. G. Schirmer.

PEINECKE, HENRY J., D.V.M.
15 W. Maple St., Allendale, N. J.
Vouchers: R. D. Barner and W. O. Brinker.

PERRY, DONALD K., D.V.M.
Paw Paw, Ill.
Vouchers: W. O. Brinker and G. H. Conner.

PIERMATTEI, DONALD L., D.V.M.
824 S. Waiola Ave., LaGrange, Ill.
Vouchers: W. F. Keller and E. K. Sales.

RINES, MARK P., D.V.M.
School of Veterinary Medicine, Michigan State College, East Lansing, Mich.
Vouchers: G. R. Moore and E. K. Sales.

ROOKER, JAMES A., D.V.M.
6015 Stroebel Rd., Saginaw, Mich.
Vouchers: W. F. Riley, Jr., and R. G. Schirmer.

ROSE, CLELAND E., D.V.M.
816 N. Ball, Owosso, Mich.
Vouchers: J. R. DeVries and G. H. Conner.

SKINNER, THOMAS J., D.V.M.
415A Willow Lane, East Lansing, Mich.
Vouchers: R. G. Schirmer and A. C. Wheeler.

SNYDER, GERALD R., D.V.M.
Box 123, Quinnesec, Mich.
Vouchers: W. F. Keller and R. L. Mowry.

STETSON, JOHN A., D.V.M.
7 South St., St. Johnsbury, Vt.
Vouchers: W. F. Keller and R. L. Mowry.

STOGIS, PAULETTE, D.V.M.
Rt. 1, Box 3, Sodus, Mich.
Vouchers: W. F. Riley, Jr., and C. F. Cairy.

STONE, ROBERT M., D.V.M.
24728 Scotia St., Oak Park, Mich.
Vouchers: W. F. Keller and R. G. Schirmer.

TJALMA, RICHARD A., D.V.M.
39 W. 19th St., Holland, Mich.
Vouchers: R. G. Schirmer and A. C. Wheeler.

TODD, RICHARD B., D.V.M.
40 Ford Place, Bridgeport, Conn.
Vouchers: W. F. Riley, Jr., and C. F. Clark.

VANDERWAGEN, LAWRENCE C., D.V.M.
Zuni, N. M.
Vouchers: E. K. Sales and R. G. Schirmer.

WAKEFIELD, DAVID J., D.V.M.
6448 N. Clark St., Chicago, Ill.
Vouchers: W. O. Brinker and R. D. Barner.

WATSON, DONALD R., D.V.M.
805 Maple Lane, East Lansing, Mich.
Vouchers: G. H. Conner and R. G. Schirmer

WIRGAU, MARLO H., D.V.M.
29554 Magnolia Ave., Flat Rock, Mich.
Vouchers: W. O. Brinker and R. G. Schirmer.

Ohio State University

FOLLIS, THOMAS B., D.V.M.
1518 Bryden Rd., Columbus, Ohio.
Vouchers: H. F. Groves and D. O. Jones.

Texas A. & M. College

BROUSSARD, VANCE L., D.V.M.
3401 10th St., Port Arthur, Texas.
Vouchers: C. Fink and R. B. Wilcox.

SMITH, CHARLES K., D.V.M.
P. O. Box 206, Elizabethtown, Ky.
Vouchers: W. W. Armistead and F. P. Jaggi, Jr.

Tuskegee Institute

WEBBER, LANXTER D., D.V.M.
1438 G St., S. E., Washington, D.C.
Vouchers: G. W. Cooper and M. V. Weathersby.

Second Listing

Alabama Polytechnic Institute

BASCO, JAMES, D.V.M., 261½ Wall St., Shreveport, La.
NELSON, DONALD B., D.V.M., Rt. 1, Chipley, Fla.
POITEVINT, OTTIS L., D.V.M., 405 S. Denton St., Dothan, Ala.
SHAUL, JOHN C., D.V.M., 769 Vance Ave., Memphis, Tenn.
STINE, ROBERT H., D.V.M., c/o Irby Veterinary Hospital, Mobile, Ala.

University of California

BAKER, ROBERT H., D.V.M., 818 Alta Vista Dr., Sierra Madre, Calif.
BAYMILLER, PATRICK H., D.V.M., 1018 Allerton St., Redwood City, Calif.
BREWER, ROBERT L., D.V.M., Box 456, Oakdale, Calif.
BURROWS, GORDON F., D.V.M., 1038 W. 101st St., Los Angeles, Calif.
CARROLL, ROBERT E., D.V.M., 5431 San Fernando Rd., Los Angeles, Calif.
COLE, JERROLD W., D.V.M., 507-H East Valna Dr., Whittier, Calif.
DILLON, BEN E., D.V.M., 2186 Del Rio Dr., Stockton, Calif.
HARTJEN, LOUIS A., D.V.M., 9075 Palm, Bellflower, Calif.
McWHINNEY, BENJAMIN M., D.V.M., 413 Willow St., San Jose, Calif.
MENGLE, HOLMES R., JR., D.V.M., 4151 Walnut, Chino, Calif.
PROCTOR, LAWRENCE M., JR., D.V.M., S. P. C. A. Hospital, 2500 16th St., San Francisco, Calif.
RIFKIND, LEO M., D.V.M., 1735 S. Burlington Ave., Los Angeles, Calif.
ROBINSON, ROBERT R., D.V.M., 15 W. Carlton Way, Tracy, Calif.
WEBSTER, CHARLES B., D.V.M., 1911 Hunnewell St., Honolulu, Hawaii.

Colorado A. & M. College

SWENA, EDWARD M., D.V.M., 505 Arapahoe St., Golden, Colo.

University of Illinois

BOTTORFF, ARTHUR A., D.V.M., Williamsville, Ill.
ELDER, JOHN C., D.V.M., Box 107, Bement, Ill.
GRAHAM, ALLAN L., D.V.M., Ursa, Ill.
HALL, RALPH F., D.V.M., 2920 Harrison St., Davenport, Iowa.
McQUEEN, RALPH D., D.V.M., McLean, Ill.
MERRICK, JOHN W., D.V.M., 4109 Elm St., Brookfield, Ill.
ZUSCHLAG, WALTER E., D.V.M., 5817 S. Troy St., Chicago, Ill.

Iowa State College

ASHBAUGH, REUBEN E., D.V.M., Wall Lake, Iowa.
BALL, ROGER A., D.V.M., R. R. 1, Eldora, Iowa.
BARRINGTON, GLEN E., D.V.M., Alexis, Ill.
BAYLES, HOWARD E., D.V.M., 4627 W. 87th Place, Oak Lawn, Ill.
BERAN, GEORGE W., D.V.M., Riceville, Iowa.
BOTTORFF, DARYL D., D.V.M., Rt. 4, Webster City, Iowa.
BROCKSMITH, PAUL E., D.V.M., Bicknell, Ind.
BUSH, JOHN A., D.V.M., 304 S. 27th St., Lafayette, Ind.
COX, THEODORE X., JR., D.V.M., Armour, So. Dak.
COYNE, JOHN J., D.V.M., Traer, Iowa.
DeWITT, ROSS C., D.V.M., Milford, Iowa.
DICKINSON, CHARLES S., D.V.M., Elburn, Ill.
FABER, WAYNE H., D.V.M., 26 2nd St., N. W., Lemars, Iowa.
FRANCIS, JAMES D., D.V.M., Rt. 3, Davenport, Iowa.
GLOTFELTY, ROBERT W., D.V.M., 2541½ Prairie Ave., Evanston, Ill.
HAAS, HOWARD A., D.V.M., Glasgow Animal Clinic, Glasgow, Ky.
HAROMY, JOHN C., JR., D.V.M., Box 223, Hobe Sound, Fla.
HYDE, NORRIS J., D.V.M., Preston, Idaho.
JENSEN, JAMES C., JR., D.V.M., 2030 Pammel Ct., Ames, Iowa.
JORDAHL, GENE W., D.V.M., 826 Park St., Minot, N. Dak.
LANG, MERLE H., D.V.M., 2924 Harrison St., Davenport, Iowa.
LYONS, HENRY B., D.V.M., Park Street Extension, Bennington, Vt.
McKENNA, DONALD J., D.V.M., Mallard, Iowa.
McMARTIN, KENNETH D., D.V.M., Garner, Iowa.
MEYERHOLZ, GEORGE W., D.V.M., County Highway Dept. Bldg., Freeport, Ill.
MIYAHARA, ALLEN Y., D.V.M., 1474 Kinau St., Honolulu, Hawaii.
MURPHY, EDWARD J., D.V.M., 202 W. 4th St., Jasper, Ind.
NELSON, ROBERT J., D.V.M., Waupaca, Wis.
NICOLL, HOWARD C., D.V.M., 201 North 1, Mount Pleasant, Iowa.
PAHLE, RAYMOND G., D.V.M., 901 19th St., Moline, Ill.
PETERSEN, HORACE A., D.V.M., Sheffield, Ill.
PITCHER, MARSHALL O., D.V.M., 321 E. South St., Freeport, Ill.
REECE, WILLIAM O., D.V.M., Galesville, Wis.
ROMANS, STANLEY C., D.V.M., 3201 Cleveland, Des Moines, Iowa.
RUGGER, WILLIAM T., D.V.M., Oxford, Iowa.
SCHMALL, LEO M., D.V.M., 9 Westview Dr., Mason City, Iowa.
SHEY, DANIEL J., D.V.M., 511 E. State St., Algona, Iowa.
SMITH, JOHN E., D.V.M., Garnavillo, Iowa.
STEINER, CONRAD S., D.V.M., Russell Cove Pike, Lexington, Ky.

SUTHERLAND, LEE G., D.V.M., 576 Mayfield Rd., Benton, Ky.
TURNER, KENNETH L., D.V.M., Greenfield, Ill.
VOTTELER, VINCENT A., D..V.M., Fenton, Iowa.
WARNER, ROBERT N., D.V.M., Buckingham, Pa.
WATSON, BARRIE D., D.V.M., 519 E. 6th St., West Liberty, Iowa.
WELBOURN, DALE K., D.V.M., Neola, Iowa.
ZIMMERMAN, FRED C., D.V.M., Rt. 2, Junction City, Wis.

University of Missouri*

BAKER, BERNARD M., D.V.M., East Washington Dr., East Prairie, Mo.
BLACKWELL, LEWIS B., D.V.M., 208 Marvin, Owensville, Mo.
FISHER, ROBERT A., D.V.M., Ashland, Ill.
NETSCH, NEWELL P., D.V.M., R. R. 3, Windsor, Mo.

Ohio State University

ALEXANDER, ROBERT, D.V.M., R. R. 1, Pemberville, Ohio.
ARNSTEIN, PAUL, D.V.M., 3149 E. Derbyshire, Cleveland Heights, Ohio.
BAKER, DEAN S., D.V.M., Bakerholme Farms, Jewett, Ohio.
BARTELS, HARRY F., D.V.M., Rt. 2, Burton, Ohio.
BETTMAN, ALFRED, D.V.M., R. R. 3, Plain City, Ohio.
BOGER, ROBERT L., D.V.M., 1270 Willard Ave., Warren, Ohio.
BOOTHE, NORRIS E., D.V.M., 112 W. Division St., Chicago, Ill.
BURWELL, ROBERT L., D.V.M., Sunbury, Ohio.
BUTLER, JOHN G., D.V.M., Rt. 1, Coshocton, Ohio.
CERNIGA, RAYMOND M., D.V.M., Spitler Rd., Poland, Ohio.
COOK, RICHARD W., D.V.M., R. D. 3, Cortland, Ohio.
COVERT, WILLIAM E., D.V.M., Peebles, Ohio.
COY, FRANKLIN A., D.V.M., 8208 Carnegie Ave., Cleveland, Ohio.
CRAGG, ALAN P., D.V.M., Rt. 4, Chardon, Ohio.
CULBERTSON, WAYNE C., D.V.M., 2778 Innis Rd., Columbus, Ohio.
DOTY, LAYSON T., D.V.M., 2638 Clermont Dr., Apt. F., Columbus, Ohio.
FERRIS, FORREST G., D.V.M., R. F. D. 3, Camden, Ohio.
FIX, F. JEROME, D.V.M., R. R. 1, Beechwood Rd., New Town, Ohio.
FRANZMANN, ALBERT W., D.V.M., 1450 Ross-Millville Rd., Hamilton, Ohio.
GABEL, ALBERT A., D.V.M., 1945 Olentangy River Rd., Columbus, Ohio.
GIGLIOTTI, THOMAS W., JR., D.V.M., 4807 Elyria Ave., Lorain, Ohio.
GRADY, KARL S., JR., D.V.M., 1038 N. Bend Rd., Cincinnati, Ohio.
HAKOLA, ROBERT A., D.V.M., 136 S. Richardson Ave., Columbus, Ohio.
HANCE, ROBERT T., D.V.M., Box 108 Rt. 3, Loveland, Ohio.
HOFMANN, GEORGE W., D.V.M., 1473 Neil Ave., Columbus, Ohio.
HOLLIS, HARVEY G., D.V.M., R. R. 2, New Albany, Ind.
HOUK, RAYMOND E., D.V.M., 802 W. Hunter, St., Logan, Ohio.
JANTZ, JAMES T., D.V.M., R. R. 1, Box 35, Elgin, Ill.
KASZAR, ERNEST, D.V.M., Dorset, Ohio.
KINDINGER, RICHARD A., D.V.M., R. R. 2, Crestline, Ohio.
LIGGETT, JOHN H., D.V.M., 430 St. Clair Ave., Cadiz, Ohio.
LINDSAY, EARL E., JR., D.V.M., R. F. D. 3, Massillon, Ohio.
MCGUIRE, JACK A., D.V.M., Box 221, Alexandria, Ohio.
MARTIN, DONALD B., D.V.M., R. R. 1, Pekin, Ind.
NEHAY, JOHN, D.V.M., Rt. 1, Box 196, Perrysburg, Ohio.
NIXON, GEORGE F., JR., D.V.M., 1452 W. State St., Alliance, Ohio.
OLIVER, FORREST H., D.V.M., 108 Monhagen, c/o George Halbig, Middletown, N. Y.
OVERPECK, RICHARD L., D.V.M., 116 N. Michigan St., Rockville, Ind.
PATTERSON, WILLIAM C., D.V.M., 2311 Pike Rd., Parkersburg, W. Va.
PETERSON, STANLEY E., D.V.M., 1093 Rombach Ave., Wilmington, Ohio.
PFOST, JOHN J., D.V.M., 400 Court St., Ripley, W. Va.
PRASUHN, LLOYD W., D.V.M., R. R. 4, Greenville, Ohio.
REED, FORREST A., D.V.M., 846 W. Central Ave., Toledo, Ohio.
REED, GERALD B., D.V.M., 1028 Proprietors Rd., Worthington, Ohio.
ROENIGK, WILLIAM J., D.V.M., Veterinary Clinic, Ohio State University, Columbus, Ohio.
SALTER, HERBERT W., JR., D.V.M., 6221 Bluffton Rd., Fort Wayne, Ind.
SATTLER, FREDERICK P., D.V.M., 16 W. Rathbone Rd., Columbus, Ohio.
SAUM, ALLEN N., D.V.M., Heights Dog and Cat Hospital, Cedar and Lee Rd., Cleveland Heights, Ohio.
SCHERER, ROBERT S., D.V.M., R. F. D. 3, Shelby, Ohio.
SCHLOSSER, RUSSELL C., D.V.M., 308 N. Main St., Arcanum, Ohio.
SHARP, BRUCE H., D.V.M., New Carlisle, Ind.
SHEPHERD, JOHN L., D.V.M., Box 75, Morristown, Ohio.
SLAVIK, JAMES D., D.V.M., Coldwater, Ohio.
SLUSHER, RALPH, D.V.M., R. R. 1, Mason, Ohio.
SMITH, ROYCE W., D.V.M., 268 S. Main St., Mansfield, Ohio.
SPENCER, HAROLD C., D.V.M., Sistersville, W. Va.
STANLEY, THOMAS F., D.V.M., R. D. 2, Beloit, Ohio.
STEFFEN, PAUL E., D.V.M., 501 Georgia St., Sheridan, Ind.

TARBILL, GALE D., D.V.M., New Holland, Ohio.
THARP, VICTOR V., D.V.M., New Washington, Ohio.
THOMAS, WILLIAM L., D.V.M., 129 W. 10th Ave., Columbus, Ohio.
TOMASEK, JAMES E., D.V.M., 133 W. Oakland Ave., Columbus, Ohio.
WARNER, CHARLES G., JR., D.V.M., 516 Broad St., Murray, Ky.
WEIBEL, DON A., D.V.M., 13057 Cedar Rd., Cleveland Heights, Ohio.
WEIDENBENER, EDWARD A., D.V.M., 716 E. Broadway, Louisville, Ky.
WILLIAMS, PAUL E., D.V.M., Hobart, Ind.
WILLIAMSON, WEAVER M., D.V.M., Rt. 2, Hillsboro, Ohio.

Ontario Veterinary College

BAILEY, DENIS W. R., D.V.M., Smith St., Matamata, N. Z.
FREEMAN, WILLIAM A., D.V.M., 25 Riverside Dr., Elmira, Ont.

University of Pennsylvania

ADAMS, WILLIAM M., JR., V.M.D., Albion, Pa.
ANDERSON, WILLIAM F., V.M.D., 163 South St., Hightstown, N. J.
BAKER, WALTER J., V.M.D., Box 141, Moon Run, Pa.
BUCHANAN, RAMSAY S., V.M.D., 104 Hampden Ave., Narberth, Pa.
BUSTER, JEAN C., V.M.D., 7211 Summit Ave., Chevy Chase, Md.
CHESEN, DONALD M., V.M.D., 4838 N. 9th St., Philadelphia, Pa.
COHEN, ROBERT H., V.M.D., 30 Maple Ave., Westbury, N. Y.
COLLINS, BERNARD M., V.M.D., 1000 South St., Pittsfield, Mass.
DONOVAN, RICHARD H., V.M.D., 28 Brooks St., West Medford, Mass.
DREISBACH, ROBERT C., V.M.D., Wescoesville, Pa.
EDELBLUT, JAMES Z., V.M.D., 145 East Short St., Lexington, Ky.
EDMONDS, HUGH W., V.M.D., Haubrich Veterinary Clinic, Claremont, N. H.
EMERSON, JOHN G., V.M.D., R. D. 5, Bridgeton, N. J.
EVANS, JOSEPH P., V.M.D., 92 W. Chestnut St., Wilkes Barre, Pa.
FEGLEY, HARRY C., V.M.D., 418 Shakespeare Ave., Melton, Pa.
FLOWERS, ROBERT D., V.M.D., New Bloomfield, Pa.
FRANKLIN, WILLIAM H., V.M.D., 27 Mechanix St., North Easton, Mass.
GERARD, SHERWOOD, V.M.D., 30 Hebron St., Hartford, Conn.
GRAF, WILLIAM R., V.M.D., 123 Manor Ave., Millersville, Pa.
INGRAHAM, DAVID S., V.M.D., 2627 Logan St., Camp Hill, Pa.
IRWIN, AVERRY M., V.M.D., 322 Clark St., Bellwood, Pa.
JACKSON, RALPH B., V.M.D., 208 Edgemore Rd., Secane, Pa.
KIFT, CRAIG M., V.M.D., 14 Bruner St., Muncy, Pa.
LAMBERT, PAUL D., V.M.D., Box 496, Beaver Falls, Pa.
HOLTMAN, SEYMOUR, V.M.D., 113 Nelton Court, Hartford, Conn.
MAROOKIAN, EDGAR R., V.M.D., 181 Sussex St., Old Forge, Pa.
MEIRS, DAVID A., II, V.M.D., Cream Ridge, N. J.
MILLER, WAYNE L., V.M.D., Universal Rd., Pittsburgh, Pa.
MOHLER, JOHN R., II, V.M.D., 5508 Nebraska Ave., N. W., Washington, D. C.
NEHODA, WILLIAM R., V.M.D., R. D. 4, Easton, Pa.
O'CONNER, JOHN A., V.M.D., 10 Anderson Ave., Three Rivers, Mass.
POST, RICHARD C., V.M.D., 114 Stock St., Hanover, Pa.
RASTAS, VYTAS, V.M.D., 537 Myrtle Ave., Bridgeport, Conn.
RUBIN, LEON D., V.M.D., 1605 Gowen Ave., Philadelphia, Pa.
SCHILLING, KURT A., V.M.D., 4404 Pine St., Philadelphia, Pa.
SCHWARTZ, JOHN C., V.M.D., R. D. 1, East Berlin, Pa.
SELL, DORIS J., V.M.D., 2534 N. 8th St., Philadelphia, Pa.
SYNDER, DEAN L., V.M.D., R. D. 1, Annville, Pa.
STAUD, JAMES K., V.M.D., 3104 Norwood Ave., Pittsburgh, Pa.
THOMPSON, WALTER R., V.M.D., Dublin, Va.
VACLAVIK, MELVIN E., V.M.D., R. D. 1, Box 259, Smithfield, Pa.
MANLOVE, LEROY, V.M.D., 2917-A New Hope St., Philadelphia, Pa.

Texas A. & M. College

BESCH, EVERETT D., D.V.M., Rt. 1, Box 143, Cibolo, Texas.
BRUECHNER, HERMAN M., D.V.M., 501 W. 3rd St., Sweetwater, Texas.
CLARKE, NEVILLE P., D.V.M., Box 455, Eldorado, Texas.
COCHRAN, PHILLIP H., D.V.M., 3560 Jackson Ave., Memphis, Tenn.
FISH, JAMES G., JR., D.V.M., 474 W. 71st St., Jacksonville, Fla.
FULLER, GERALD R., D.V.M., 636 E. 4th Ave., Mesa, Ariz.
HOORES, ERNEST G., D.V.M., 188 St. Andrews Blvd., Charleston, S. Car.
SCOTT, DANIEL E., D.V.M., Murchison, Texas.
TARVER, WENDELL L., D.V.M., Rt. 2, Burnet, Texas.
WILLIFORD, RAYMOND C., D.V.M., 6622 Buffalo Speedway, Houston, Texas.

Tuskegee Institute

BURKE, FREDERICK J., D.V.M., 8614 Agnes Ave., St. Louis, Mo.

GROSS, RODNEY T., JR., D.V.M., 108 Shannon St., Dayton, Ohio.

HENRY, MAXWELL R., D.V.M., 27-35 McIntosh, East Elmhurst, N. Y.

JONES, WILLIAM A., D.V.M., 705 N. Ash St., Ottumwa, Iowa.

KING, MARSHALL, D.V.M., Box 162, New Albany, Ind.

THOMAS, MICHAEL E., D.V.M., P. O. Box 609, Tuskegee Institute, Ala.

COMMENCEMENTS

Michigan State College.—At the 1954 commencement exercises of the School of Veterinary Medicine, Michigan State College, the following 55 candidates were presented for the D.V.M. degree.

James D. Auvil
Peter C. Baldwin
Clifford C. Beck
Jean B. Beckwith
Charles D. Benson
George A. Bergman
Herald H. Boschult
Louis W. Boyer
Eugene H. Brekke
Larry A. Brengle
Joseph R. Calhoon
Joyce L. Cathey
Neal R. Cholvin
Hollis H. Clark, Jr.
Dale E. Croxton
George Cruickshank
Kenneth N. DeWeerd
Albert Dobias
Raymond H. Elbing
Daniel Ellinger
David I. Epstein
Lawrence Gearhart
Allen I. Gleeman
Arthur E. Hall
Homer D. Hanna
Ward V. Herbert
Richard J. Kearns
Richard D. Lindsay
George S. McClarnon
John F. Medlock
Robert W. Medlock
Gerald J. Miedema
Norman R. Miller
Gerald D. Mitchell
John D. Parker, Jr.
Robert E. Pearson
Henry J. Peinecke
Donald K. Perry
Donald L. Piermattei
Milton E. Prickett
Patricia Prickett
Mark P. Rines
James A. Rooker
Cleland E. Rose
Thomas J. Skinner
Gerald R. Snyder
John A. Stetson
Paulette Stogis
Robert M. Stone
Richard A. Tjalma
Richard B. Todd
L. C. Vanderwagen
David J. Wakefield
Donald R. Watson
Marlo H. Wirgau

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University of Montreal.—At the 1954 commencement exercises of the Ecole de Médecine Vétérinaire de la Province de Québec, Saine-Hyacinthe, Que., the following 18 candidates were presented for the D.M.V. degree.

Michel Beauregard
Michel Blouin
Guy Cadieux
Pierre Cayouette
Jean-Marie Dionne
Albert Fleurent
Pierre Grégorie
Jean-Paul Grondin
Fernand Hamelin
André Lagacé
Marcel Léger
Donald Mayrand
Hubert Pagé
Guy Meilleur
Camille Rouillard
Oliver Senneville
Lucien Servant
Jean-R. Thébret

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Oklahoma A. & M. College.—At the 1954 commencement exercises of the School of Veterinary Medicine, Oklahoma A. & M. College, on May 31, the following 34 candidates were presented for the D.V.M. degree.

I. P. Antin
J. R. Atkins
E. A. Barce
W. R. Barrowman
J. E. Bruce
J. D. Carter
W. R. Carter
J. E. Christy
G. L. Clement
M. E. Dreisbach
P. W. Edmundson
J. B. Foley
C. R. Hales
H. K. Henderson
J. V. Hendrix
D. G. Hobson
D. K. Holmes
K. K. Keahey
R. M. Kenney
L. D. Lauener
R. L. Lessert, Jr.
W. N. Lyon
M. W. Markham
G. P. Mayer
C. D. Mayes
J. E. McLaurin
R. R. Orr
D. F. Patterson
C. E. Porter
S. M. Schor
J. N. Southall
E. E. Staley
K. K. Stinson
C. E. Wasson

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University of Pennsylvania.—At the 1954 commencement exercises of the School of Veterinary Medicine, University of Pennsylvania, the following 47 candidates were presented for the V.M.D. degree.

William M. Adams, Jr.
Henry J. Adler
William F. Anderson
Walter J. Baker
Ramsay S. Buchanan
Jean C. Buster
Donald M. Chesen
Robert H. Cohen
Bernard M. Collins
Richard H. Donovan
Robert C. Dreisbach
James Z. Edelblut
Hugh W. Edmonds
John G. Emerson
Joseph P. Evans
Harry C. Fegley
Robert D. Flowers
William H. Franklin
Sherwood Goldberg
William R. Graf
Fred D. Hagerty
Norman D. Heidelbaugh
Seymour Holtman
David S. Ingraham
Averry M. Irwin
Ralph B. Jackson
Craig M. Kift
Paul D. Lambert
Leroy Manlove
Edgar R. Marookian
David A. Meirs
Wayne L. Miller
John R. Mohler
William R. Nehoda
John A. O'Connor
Richard C. Post
Vytas P. Rastas
Robert F. Reichard
Leon D. Rubin
Kurt A. Schilling
John C. Schwartz
Doris J. Sell
Ralph G. Skillen
Dean L. Snyder
James K. Staud
Walter R. Thompson
Melvin E. Vaclavik

U. S. GOVERNMENT

Plum Island Virus Laboratory Opens.—With cattle, hogs, and sheep already in quarantine on Plum Island and one unit of the building ready to launch research on the virus of foot-and-mouth disease, the last inspection by nonworkers was allowed in July. The building will be completed in 1956.

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Veterinary Personnel Changes.—The following changes in the force of veterinarians in the U.S.D.A. Agricultural Research Service are reported as of July 23, 1954.

NEW APPOINTMENTS

Malcolm Barksdale, Jr., Columbia, S. Car.
Ralph D. Barner, Denver, Colo.
Norman G. Bearden, Jackson, Miss.
Clifford L. Belfield, Jr., South St. Paul, Minn.
Harry F. Blanchard, Albuquerque, N. M.
Philip D. Cazier, Fort Worth, Texas.
Augusts Daugulis, Sioux City, Iowa.
John B. Favara, Chicago, Ill.
Carl D. Griffin, Fort Worth, Texas.
Norman D. Heidelbaugh, Jacksonville, Fla.
Maxwell R. Henry, Los Angeles, Calif.
Paul J. Homme, St. Paul, Minn.
Donald G. McLean, Denver, Colo.
William F. Meriwether, Atlanta, Ga.
Vaughn W. Morrison, Indianapolis, Ind.
Antanas Niksas, Sioux City, Iowa.

Robert W. Page, St. Paul, Minn.
Merrill D. Radloff, San Diego, Calif.
Vytas P. Rastas, South St. Paul, Minn.
Alton C. Reiten, Denver, Colo.
Jack N. Sohrbeck, Denver, Colo.
Sidney L. Wolf, Philadelphia, Pa.

CANCELLATION OF APPOINTMENTS

David R. Berzon, Chicago, Ill.
William F. Meriwether, Atlanta, Ga.

RESTORATION After Military Furlough

Charles W. Freudenberg, Indianapolis, Ind.
Joseph S. Rube, Little Rock, Ark.

RETIREMENTS

John M. Brand, Olympia, Wash.
Glenn R. Curtis, San Diego, Calif.
William M. Hobdy, Fort Worth, Texas.
Arthur W. Horstman, Fort Worth, Texas.
Anthony J. Matter, St. Paul, Minn.

RESIGNATIONS

Thomas M. Baldwin, San Francisco, Calif.
Wilburn B. Cochran, Raleigh, N. Car.
Rafael Echegaray, San Juan, P. R.
John F. Hinz, Bismarck, N. Dak.
Lester Johnson, Fort Worth, Texas.
Keith T. Maddy, San Francisco, Calif.
John A. Nielsen, Oklahoma City, Okla.
William B. Redman, Sr., Omaha, Neb.
John W. Robinson, Bismarck, N. Dak.
Harry V. Sucher, Los Angeles, Calif.

TERMINATIONS

Bradford A. Hyatt, Buffalo, N. Y.
Milton Savan, Amsterdam, Holland.

TRANSFERS

Elmer Christopherson, from Los Angeles, Calif., to Omaha, Neb.

Salvatore Corridore, from Newark, N. J., to New York, N. Y.

Marion L. Cravens, from Mishawaka, Ind., to Detroit, Mich.

LeRoy T. Fisher, from Jacksonville, Fla., to Jackson, Miss.

Aubrey M. Hutton, from New Haven, Conn., to Boston, Mass.

William O. Kerr, from Archbold, Ohio, to South St. Paul, Minn.

Edgars Kleinbergs, from Seattle, Wash., to Billings, Mont.

Herbert Shear, from Springfield, Mass., to Hartford, Conn.

B. Conwell Swindle, from Washington, D. C., to Jacksonville, Fla.

Hiram L. Tate, from Mishawaka, Ind., to Chicago, Ill.

Howard I. Thaller, from Hartford, Conn., to New Haven, Conn.

Oscar M. Vorthman, from Omaha, Neb., to Archbold, Ohio.

AMONG THE STATES AND PROVINCES

California

State Association Officers.—The sixty-sixth annual convention of the California State Veterinary Medical Association, held June 21-23 in San Diego, was attended by nearly 300 veterinarians from all parts of California.

Dr. W. J. Zontine, Lancaster, was elected president; Dr. A. M. McCapes, San Luis Obispo, first vice-president; Dr. A. Mack Scott, Long Beach, second vice-president; Dr. Charles D. Stafford, Novato, third vice-president; Mr. Charles S. Travers, San Francisco, executive-secretary; Dr. Russell Cope, Berkeley, treasurer; Dr. Fred Walker, San Diego, executive committee; Drs. C. Edward Taylor, San Francisco, and Fred B. Pulling, Atascadero, sergeants-at-arms.

Mr. Frank L. Pellissier, Whittier, was made an honorary member of the Association in recognition of his close cooperation with the veterinary profession, particularly his efforts for better sanitation in the dairy industry, with which he is associated.

S/CHARLES S. TRAVERS, *Executive Secretary.*

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Central Association.—On July 27, members of the Central California Veterinary Medical Association met in the Redwood Room of the Hotel Californian in Fresno to view the following films: "Cancer—The Problem of Early Diagnosis," "Internal Wiring of Jaw Fractures," "Bovine Allergic Dermatitis," "Bovine Surgery," and "Necropsy of an Elephant."

The following officers were elected at the May 24 meeting: Drs. I. G. LaRue, Fresno, president; Paul Carlson, Fresno, vice-president; and Herbert Piper, Fresno, secretary. Drs. Kenneth Johnson and Thomas Eville, both of Fresno, were appointed to the executive committee.

Delaware

New Castle County Association.—At the June meeting of the New Castle County Veterinary Medical Association, members were taken on a tour of the Delaware Park racetrack which included inspection of the track, stable area, and a demonstration of the activities of the photography department. Dr. George Rosenberger, president-elect of the Delaware Veterinary Medical Association, was host at the luncheon, after which all enjoyed an afternoon of racing.

S/ARTHUR P. COOGAN, *Secretary.*

Georgia

State Association.—The forty-eighth annual meeting of the Georgia Veterinary Medical Association was held at the Radium Springs Hotel, Albany, June 13-15, 1954, with 175 veterinarians and wives in attendance.

The outstanding event of the convention was the awarding of "The Veterinarian of the Year" certificate to Dr. John W. Salter, Dawson, by Dr. A. H. Quin, president-elect of the AVMA, at the convention luncheon.

The out-of-state speakers were: **Drs. A. H. Quin,** Kansas City, Mo., president-elect of the AVMA; **W. S. Gochenour,** Pitman-Moore Co., Indianapolis, Ind.; **B. F. Hoerlein,** School of Veterinary Medicine, Alabama Polytechnic Institute, Auburn; **Charles Bild,** Miami, Fla.; and **J. R. Clanton,** Charleston Heights, S. Car.

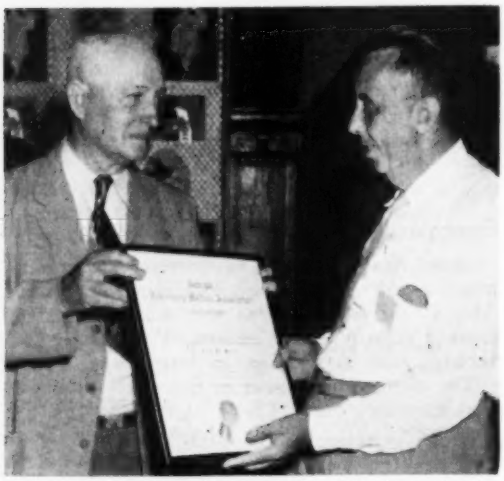
The other speakers on the program were: **Drs. A. L. Blalock,** Sylvania; **Taylor Bragg, Jr.,** Monroe; **C. L. Bromley, Jr.,** Atlanta; **J.**

E. Burnside and **W. D. Martin, Jr.**, Albany; **C. J. Mikel**, Atlanta; **E. E. Chambers**, Rossville; **T. B. Clower**, Millen; **Q. L. Darbyshire**, Moultrie; **O. M. Dodgen**, Calhoun; **A. M. Mills**,

Some of the speakers who addressed the forty-eighth annual meeting of the Georgia Veterinary Medical Association were (left to right)—Drs. A. H. Quin, J. R. Clanton, J. E. Burnside, B. F. Hoerlein, A. M. Mills, J. D. Morton, and C. L. Williams.

Athens; **B. F. Mood**, Savannah; **J. D. Morton**, Athens; **J. C. Powell, Jr.**, Savannah; **C. C. Sapp**, Albany; **J. D. Schaffer**, Brunswick; **Shirley Shepard**, Moultrie; **C. C. VonGremp**, Decatur; **C. L. Williams**, Rome; and **H. G. Young**, Thomasville.

At the business meeting, the following of-



Dr. John W. Salter (left) receives the "veterinarian of the year" certificate from Dr. A. H. Quin, president-elect of the AVMA.

ficers were elected: Drs. Charles Williams, Rome, president; Shirley Shepard, Moultrie, president-elect; and Chas. C. Rife, Atlanta, secretary-treasurer.

s/CHAS. C. RIFE, *Secretary.*

Atlanta Society.—The June meeting of the Atlanta Veterinary Society was held at Mammy's Shanty in Atlanta. The policies of the Society and their use was the subject of discussion.

s/C. L. BROMLEY, JR., *Secretary.*

Idaho

Officers of State Association.—On June 22, 1954, the following were elected as officers of the Idaho Veterinary Medical Association: Drs. J. G. Hayden, Pocatello, president; John Williams, Caldwell, vice-president; and A. P. Schneider, Boise, secretary. They will serve two-year terms.

s/A. P. SCHNEIDER, *Secretary.*

Indiana

Michiana Association.—On June 10, 1954, the Michiana Veterinary Medical Association held its monthly meeting in the Hotel LaSalle, South Bend. **Dr. David Bartlett,** of the American Breeder's Association, Chicago, was guest speaker. He discussed sterility problems in large animal practice.

The Association's annual family picnic was held at Jean Klock beach in Benton Harbor, Mich., on July 11. The picnic was attended and greatly enjoyed by a large number of veterinarians and their families.

s/PAUL W. HOUGH, *Secretary.*

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Tenth District Association.—On July 15, members of the Tenth District (Ind.) Veterinary Medical Association met in Dunlapsville to hear **Dr. H. E. Downing,** of Charles Pfizer Agricultural Research Farm, discuss the use of antibiotics in certain diseases of swine.

The following officers were elected: Drs. R. E. Miller, Richmond, president; F. O. Gossett, Greenfield, vice-president; and R. S. Ensign, New Castle, secretary-treasurer.

Dr. M. E. Maxson, who has entered general practice in New Castle, was introduced as a new member. The hosts for the evening were Dr. and Mrs. Byron Eaton, Dr. and Mrs. M. E. Hayes, and Dr. and Mrs. Chas. Gates, all of Liberty.

s/J. L. KIXMILLER, *Resident Secretary.*

Maine

Summer Meeting.—The summer meeting of the Maine Veterinary Medical Association was held at the Homewood Inn in Yarmouth on July 14.

The program consisted of a panel discussion on small animal diseases and practice problems conducted by **Dr. Sidney Stiles,** Falmouth; a discussion of bulk tanks in Maine dairies by **Dr. Kenneth Johnson,** state milk inspector; and research on bovine breeding problems, by **Dr. S. A. Asdell,** Cornell University, Ithaca, N. Y.

After the business meeting, members and

their families and guests enjoyed a banquet (lobster) and social hour.

s/J. F. WITTER, *Secretary.*

Maryland

State Association.—The annual meeting of the Maryland State Veterinary Medical Association was held at the Hotel George Washington in Ocean City, July 1-2, 1954.

The program listed the following speakers: **Drs. Harold E. Schaden,** Frederick; **Irving Cashell,** Washington, D. C.; **John D. Beck,** School of Veterinary Medicine, University of Pennsylvania, Philadelphia; **John D. Gadd,** Cockeysville; **Dale A. Wiley,** Jarrettsville; **Ernst L. Biederstein,** New York State Veterinary College, Cornell University, Ithaca; **S. F. Scheidy,** Sharp and Dohme, West Point, Pa.; **L. J. Poelma,** Livestock Sanitary Laboratory, College Park; **Archie Frank,** Beltsville; **A. L. Breuckner,** Maryland State Board of Agriculture, Baltimore; **Asa Winter,** U. S. Department of Agriculture, Animal Disease Eradication Branch, Washington, D. C.; **D. L. Proctor,** Lexington, Ky.; **L. B. Tennison,** Lederle Laboratories, Pearl River, N. Y.; and **E. M. Sacchi,** Livestock Sanitary Laboratory, College Park.

s/JOHN D. GADD, *Secretary.*

Missouri

Kansas City Association.—At the July 20 meeting of the Kansas City Veterinary Medical Association in the Livestock Exchange Building, **Dr. E. T. Riley,** Hobart, Okla., gave some practical tips on cattle practice.

s/J. C. DAVIS, *Secretary.*

Montana

State Association.—The forty-fourth annual meeting of the Montana Veterinary Medical Association was held in Miles City, June 17-19, 1954.

The following speakers participated in the program: **Drs. R. L. Cowan,** Billings; **George W. Mather,** School of Veterinary Medicine, University of Minnesota, St. Paul; **J. D. Melcher,** Forsyth; **Louis DS. Smith,** Montana State College, Bozeman; and **V. D. Stauffer,** Arvada, Colo.

Those in attendance also visited Fort Keogh Experiment Station to observe the experimental work in progress.

s/E. A. TUNNICLIFF, *Secretary.*

New Jersey

State Association.—The summer meeting of the Veterinary Medical Association of New Jersey was held June 23 at the Sunset Avenue Solarium in Asbury Park.

The following speakers addressed the group: **Drs. Arthur Bartenslager,** Stewartstown, Pa.; **Ryland Croshaw,** Columbus; **John Hamilton,** Clinton; **Charles Hoefle,** Wilton; **Raymond Huff,** Newton; **Paul James,** Agriculture Research Service, Animal Disease Eradication Branch, U.S.D.A.; and **Amos Stults,** Hopewell.

s/J. R. PORTEUS, *Resident Secretary.*

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State Association Sponsors Exhibit on Nutrition.—The Veterinary Medical Association of New Jersey, in cooperation with public health and other agencies, sponsored and participated in the planning and showing of an exhibit setting forth the advantages of the uses of milk as a factor in human nutrition. This exhibit was shown at the state museum from June 10 to 11, inclusive.

s/J. R. PORTEUS, *Resident Secretary.*

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Metropolitan Association.—At the annual business meeting of the Metropolitan New Jersey Veterinary Medical Association, the following officers were elected: Drs. L. Everett Estler, Arlington, president; Bernard M. Weiner, Newark, vice-president; and Myron S. Arlein, Maplewood, secretary-treasurer.

s/MYRON S. ARLEIN, *Secretary.*

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New Law on Ear Trimming.—On June 24, 1954, Governor Robert B. Meyner signed a bill making veterinarians the only persons legally authorized to perform operations on the tails and ears of animals "with the effect of altering the natural carriage of such tail or ear."

s/JOHN R. MCCOY, *Secretary,*
New Jersey Veterinary Medical Association.

North Carolina

State Association.—The fifty-third annual meeting of the North Carolina State Veterinary Medical Association was held at the Hotel Robert E. Lee in Winston Salem on June 22-23, 1954, with approximately 125 veterinarians in attendance.

The following out-of-state speakers addressed the convention: **Drs. J. R. Dick,** Fort Dodge, Iowa; **J. H. Edwards,** Memphis, Tenn.; **W. O. Greene,** Nashville, Tenn.; **Lt. Col. N. G. MacEachern,** Maxwell Air Force Base, Ala.; and **F. H. Oberst,** Manhattan, Kan.

The following members also presented papers: **Drs. N. G. Baird,** Lumberton; **M. H. Matthis,** Wilson; **J. G. Martin,** Boone; **J. P. Mauney,** Kings Mountain; **C. B. Randall,** Kinston; **C. M. Sellars,** Burlington; **A. W. Smith,** Farmville; **R. W. Smith,** Jacksonville; **R. T. Stapleton,** Fayetteville; **R. L. Williams,** Raleigh; and **C. W. Young,** Mocksville.

Dr. A. A. Husman, Raleigh, was named honor veterinarian of the year and was presented a plaque in recognition of his outstanding services to the livestock industry and the veterinary profession. At the banquet held June 22, plaques were also presented to all the living past-presidents of the Association.

An extra feature of the meeting was a health department booth in which veterinarians so desiring could obtain a chest x ray, and have a

blood sample taken to be examined for brucellosis, leptospirosis, Q-fever, equine encephalitis, and psittacosis.

The new officers of the Association are Drs. W. D. Collins, Winston Salem, president; B. W. Dawsey, Gastonia, president-elect; R. L. Williams, Raleigh, vice-president; and C. W. Young, Mocksville, secretary-treasurer. The following were elected to the executive committee: Drs. C. R. Swearingen, Smithfield; D. R. Donahue, Morganton; M. P. Hines, Raleigh; J. G. Martin, Boone; and W. O. Slappey, Fayetteville.

s/CLYDE W. YOUNG, *Secretary.*

Ohio

Dr. Grossman Retires.—After forty years as a teacher of veterinary anatomy, Dr. James D. Grossman (OSU '14) retired as head of the Department of Veterinary Anatomy at Ohio State University in June. In deference to his outstanding contributions to the profession, he was presented with a bound volume of testimonials at a banquet in his honor. Dr. Grossman joined the anatomy staff at Iowa State College in 1914, then returned to Ohio State University as head of the department upon the retirement of Dr. Septimus Sisson in 1919. Through his co-authorship of "The Anatomy of Domestic Animals," Dr. Grossman has made a fundamental contribution to the education of the vast majority of present-day veterinarians.

Ontario

News from Ontario.—The Ontario Veterinary Association now enjoys the largest membership in its history—625 members are registered out of 670 graduates resident in the province.

The deficiencies of the present Veterinary Science Practice Act have been the cause of extensive studies by the legislative committee of the Association for quite some time. It is now proposed to have a new veterinary science practice act and this has been placed in the hands of special counsel working in conjunction with law officers of the Crown. It is expected to have the new act introduced at the next sitting of the legislature. It would appear that the timing is advantageous since some revisions to the Medical Act are under way, and the redefining of both medical and veterinary practice will be in parallel. It is hoped that the scope of the new act will be broadened and at the same time set in more precise terms than heretofore.

The Ontario Association was host at the meeting of the Canadian Veterinary Medical Association held in Ottawa on August 30, 31, and September 1.

Arrangements are now going forward to hold a veterinary medical symposium at the King Edward Hotel, Toronto, on October 21. Outstanding speakers in various fields are being secured, and a hearty invitation is extended to veterinarians in states and provinces adjoining Ontario, particularly New York State and Michigan, to attend.

Interest and activity in veterinary affairs have never been higher than at the present time in Ontario.

s/W. J. RUMNEY, *Recording Secretary.*

Pennsylvania

Death of Dr. Harry W. Barnard.—Dr. Harry W. Barnard (UP '09), 80, died on July 14, 1954, in Lancaster General Hospital, Lancaster, the city which had been his home and scene of work for nearly forty-five years.

Born at Colleman, Pa., near Oxford, July 21, 1873, Dr. Barnard received his early education in the public schools and at West Chester State Normal School. After receiving his V.M.D. degree, he settled in Lancaster and practiced there until he retired in 1953. He served as secretary of the State Board of Veterinary Medical Examiners for many years and was known to hundreds of graduates for his always kindly manner. He was a Mason and Rotarian.

Surviving are his wife, Blanche L.; a son, M. Everett, of Jenkintown; a daughter, Mrs. Dorothea Fortier, of New Orleans; a brother, Dr. Everett P. Barnard, of Bryn Mawr; and a sister, Mrs. Mary B. King, of Christiana, Pa.

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Bucks-Montgomery Association.—At the June 1 meeting of the Bucks-Montgomery Veterinary Medical Association, the following officers were elected to serve the 1954-1955 year: Drs. Josephine Deubler, Newtown, president; J. D. Leaming, Abington, vice-president; V. W. Ruth, Lansdale, secretary-treasurer; and Allen Vansant, Philadelphia, delegate to the board of trustees of the Pennsylvania State Veterinary Medical Association.

Dr. Josephine Deubler has been appointed by the officials of Bucks County to serve on the newly organized health department. Bucks County is the second county in the state to have its own health and medical department.

s/VINCENT W. RUTH, *Secretary.*

Puerto Rico

Practitioner Participation in Brucellosis Control.—Effective on July 1, 1954, private practitioners in Puerto Rico will be paid by the government at the rate of fifty cents per head for drawing blood samples and other technical work in the eradication of brucellosis in cattle. This cooperation by the private practitioner has been given because of the shortage of government veterinarians in the Island and the need to carry on the brucellosis eradication program without the use of lay technicians.

s/O. A. LOPEZ-PACHECO,
Resident Territorial Secretary.

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Veterinary Association.—An extraordinary meeting of the Asociación Médico Veterinaria

de Puerto Rico was held at the Normandie Hotel in San Juan on June 12, 1954, under the presidency of Dr. Luis Montañez Rivera.

By unanimous vote, the Association took a stand against the use of lay technicians to draw blood samples in brucellosis eradication work carried on by the federal and state authorities and authorized the board of directors to take any legal steps necessary to stop such illegal practice.

A request to the government either for ten scholarships to study veterinary medicine or for the establishment of a School of Veterinary Medicine in Puerto Rico was unanimously approved.

s/O. A. LOPEZ-PACHECO,
Resident Territorial Secretary.

Texas

Personal.—Dr. Lloyd M. Reedy (TEX '54) of Dallas has been appointed to the newly created post of director of veterinary services for Texo Feeds with headquarters in Fort Worth. While at Texas A. & M., Dr. Reedy edited the poultry pathology section of the *Southwestern Veterinarian* and did special work on poultry disease diagnosis and control.

Vermont

Conference for Veterinarians.—The seventh annual conference for veterinarians, sponsored by the Vermont Veterinary Medical Association and the Department of Animal Pathology at the University of Vermont, was held on June 25-26 at Lake Bomoseen. The program speakers were: **Drs. C. E. DeCamp,** Pitman-Moore Co., Indianapolis, Ind.; **Charles G. Rickard,** New York State Veterinary College, Ithaca; **H. E. Amstutz,** Ohio State University, Columbus; and **John Canty,** Montpelier.

The main entertainment consisted of a banquet and dance on Friday evening, June 25.

s/W. B. DURRELL, *Resident Secretary.*

Virginia

Southwest Association.—The monthly meeting of the Southwest Virginia Veterinary Medical Association was held at Virginia Polytechnic Institute on July 1, with 40 Veterinarians and their families in attendance.

Dr. Kendall W. King, staff member at Virginia Polytechnic Institute, doing research in rumen physiology, addressed the group on "Some Aspects of Rumen Physiology". This was followed by a discussion period.

Officers of the Association are: Drs. C. F. Harmon, Floyd, president, and I. D. Wilson, Blacksburg, secretary-treasurer.

s/I. D. WILSON, *Secretary.*

Wisconsin

Poultry Disease Short Course.—Thirty veterinary practitioners from all over Wisconsin participated in a three-day conference on poultry diseases at the University of Wisconsin, Madison, June 28-30. The Departments of Vet-

Veterinarians who attended the conference on poultry diseases at the University of Wisconsin on June 28-30. They are (left to right)—Drs. C. C. Ellis, A. C. Todd, C. D. Lee, B. A. Beach, W. H. Patton, Virginia Bradford, C. A. Brandly, C. W. Burch.

Second row—Drs. E. K. Prather, R. L. Oettiker, Palmer Myhers, J. W. Watts, Clifford Orton, H. J. Cook, A. C. Kelman, M. T. Szatalowicz.

Third row—Drs. S. J. Schilling, H. H. Buchholz, T. B. Patek, Robert Curtis, A. E. Moats, S. D. Sleight, J. L. Welch, Leo Whitehair, C. W. Seeman, L. L. Otteson.

Back row—Drs. P. L. Thompson, Dale Kelly, J. L. Rogers, F. W. Baker, R. H. Hull, R. F. Bristol, M. L. Kaster, H. J. Landskron, Miles Agee.

Drs. L. J. Gallagher, C. M. Heth, and J. R. Fesler also attended the conference but were not present when this picture was taken.

erinary Science and Poultry Husbandry of the University and the State Department of Agriculture cooperated in presenting a program that stressed the practical problems confronting the poultry industry and the urgent need of the poultry industry for on-the-spot bona fide veterinary service. **Dr. C. D. Lee,** extension poultry pathologist from Iowa; **Dr. C. Ellis,** veterinarian for Val-lo-Will Poultry Farm, Lake Geneva, Wis.; and **Dr. A. S. Rosenwald,** extension poultry pathologist from California, assisted the Madison group in presenting up-to-date information on poultry diseases that will enable the veterinary practitioners to better handle their local problems.

Wyoming

State Association.—At the annual meeting of the Wyoming Veterinary Medical Association in Cody, June 13-14, the following speakers presented papers: **Drs. E. M. Baldwin,** Corn States Serum Co., Omaha, Neb.; **V. D. Stauffer,** Arvada, Colo.; **George Mather,** School of Veterinary Medicine, University of Minnesota, St. Paul; **Col. Stanley Edwards,** Cheyenne; **Drs. J. E. Ketcham,** Cheyenne; **Minol Ota,** Lovell; **J. F. Ryff,** Laramie; **Bert Reinow,** Pinedale; **Floyd Frank,** Laramie; and **J. O. Tucker,** Laramie.

s/J. F. RYFF, *Secretary.*

FOREIGN NEWS

Ceylon

Rabies Control Program.—Rabies has been one of the most troublesome problems confronting veterinarians in Ceylon. About two years ago, Dr. Ernest Tierkel, WHO consultant, recommended that a section for the control of transmissible diseases be formed in the Division of Epidemiology in the Department of Health, headed by a veterinary officer with public health training. In accordance with this recommendation, Dr. A. Amarasinghe, M.Sc., M.P.H., Ph.D., of Minnesota, was appointed as public health veterinary officer and a consultative committee composed of representatives from the Medical Laboratory Services, Government and Municipal Veterinary Services, and the University was appointed to assist him.

At their first meeting, the Committee recommended the intensifying of the rabies control program and decided to carry out an Island-wide survey of the following diseases: bovine tuberculosis, brucellosis, Q-fever, leptospirosis, psittacosis, anthrax, trichinosis, and hydatidosis, to determine their incidence in animals and human beings.

s/D. W. AMARASINGHE,
Foreign Corresponding Secretary.

Finland

Veterinarian Writes Story of Lapland.—During World War II, Dr. Yrjö Kokko, a Finnish veterinarian, fought against the German army in Lapland. He remained in this country for three years after the close of the war, studying the Lapp people and their way of life, and then wrote a book on much of what he learned and experienced there. "The Way of the Four Winds," a best-seller in Scandinavia, won the Grand Literary Prize in Finland. It has been translated into English, published by G. P. Putnam and Sons, New York, and sells for $5. In a review of the book, the *New York Times* says ". . . . it consists of a series of stories and sketches about life among the Lapps designed to provide a comprehensive account of every aspect of their customs, culture and techniques of survival . . . . even with its conspicuous shortcomings (mostly verbal excesses), "The Way of the Four Winds" is thoroughly interesting as a travel book."

Philippines

Annual Convention.—The thirty-first annual convention of the Philippine Veterinary Medical Association was held at the Assembly Hall of the Bureau of Animal Industry, Pandacan, Manila, May 20-22, 1954.

The following speakers participated in the program: **Drs. Manuel D. Sumulong,** president of the Philippine Veterinary Medical Association; **Rufino B. Gapuz,** vice-president and dean, Araneta Institute of Agriculture; the Hon. **Salvador Araneta,** secretary of agriculture and natural resources; **Drs. V. Villegas; F. R. Rosacia; Dean Leland Call; J. A. Cayabyab; Estefano C. Farinas; Valente Villegas; Mr. Manuel A. Pinto; Mr. Valentin Sajor,** senior forester; **Drs. Anacleto B. Coronel; Felicisimo San Agustin; Deogracias J. Cabrera; J. K. Loosli; S. L. Parina; Francisco Fronda; Laureano S. Marquez; Mr. Frank Moore; Prof. Carlos X. Burgos; Drs. Antonio Hernandez; Daniel Bolong; Mariano R. Montemayor; G. San Gabriel; A. M. Castillo; A. K. Gomez; Zacarias de Jesus; Ramon Acevedo; Crispulo Sipin; Victoriano Zaratan; and Segundo Alano.**

Those in attendance enjoyed a visit to Sharp and Dohme Laboratories and a trip to Alabang Stock Farm and Poultry Station, Alabang, Muntinlupa, Rizal.

At the business session, the following officers were elected: Drs. Anacleto Coronel, chief, research division, BAI, president; Laureano Marquez, chief, poultry section, BAI, vice-president; and Dra. Leticia Brillo-Marcelo, parasitologist, BAI, secretary-treasurer.

s/JOSE B. ARANEZ,
Foreign Corresponding Secretary.

STATE BOARD EXAMINATIONS

Texas—The Texas State Board of Veterinary Medical Examiners announces that its next veterinary licensing examination will be held on Sept. 13-14, 1954, in the Calcasieu Auditorium, third floor, 301 W. Second St., Austin, Texas. Requests for applications and additional information should be addressed to Mr. T. D. Weaver, Executive Secretary, Texas State Board Veterinary Medical Examiner, 520 Littlefield Building, Austin, Texas.

VETERINARY MILITARY SERVICE

Major Bridenstine Staff Veterinarian in Korea.—Major William A. Bridenstine, V.C., U. S. Army, has recently been assigned as staff veterinarian to the Korea Civil Assistance Command. Major Bridenstine succeeds Dr. Robert Reseinger, U.N. Korea Reconstruction Agency veterinarian, who has returned to the United States.

S/JAMES W. O'NEILL, *Assistant Public Information Officer, Korea Civil Assistance Command.*

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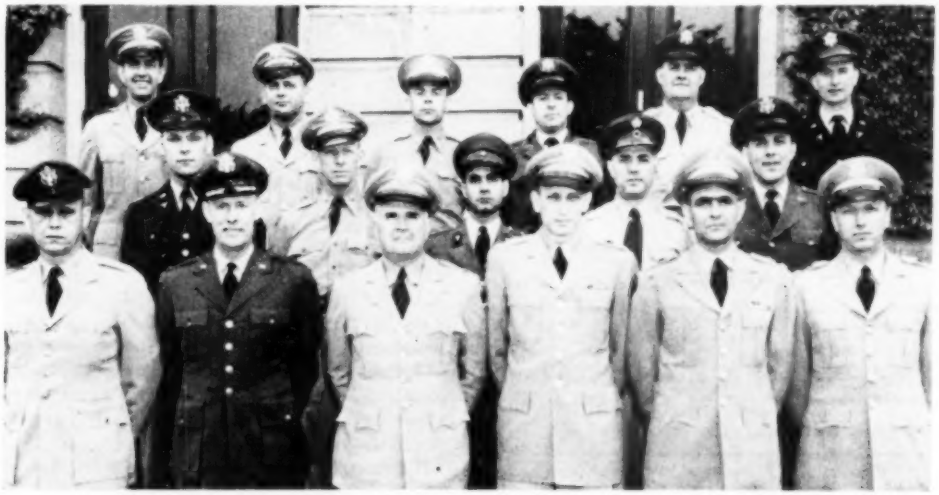
Veterinary Course Graduation at Walter Reed.—Brig. Gen. James A. McCallam, V.C. (ret.), delivered the principal address June 4 when 13 Veterinary Corps officers graduated from the third veterinary medicine course at Walter Reed Army Medical Center, Washington, D. C. The graduates also heard brief remarks by **Major Gen. Alvin L. Gorby,** deputy commander of the Center, who represented the commanding general, Major Gen. Leonard D. Heaton, at the exercises.

Brig. Gen. James A. McCallam (left) presents the Hoskins Memorial Medal to Major William E. Rothe who received the highest scholastic average of the 13 officers graduated from the 1954 course in veterinary medicine at the Walter Reed Army Medical Center, Washington, D. C.



Thirteen Veterinary Officers Graduate at Walter Reed Army Medical Center

Front row (left to right)—Lt. Col. Norton A. Orr, Col. Richard H. Jurden, Col. Robert A. Boyce, Jr., Col. Chester A. Gleiser, Lt. Col. Robert H. Yager, former director of the School's veterinary division, Lt. Col. Leslie C. Murphy, coordinator of training.

Second row—Lt. Col. Arthur L. Hogge, Jr., Lt. Col. George C. Coburn, Capt. Sd Jalaleddin Pezeshk, Col. Nicholas Koemtzopoulos, Lt. Col. Russell M. Madison.

Third row—Major Donald E. Guy, Major Robert C. McCord, Major William E. Rothe, Major Martin Kadets, Capt. Erby L. Massie, and Major Joseph E. Reid.

Colonel John R. Wood, commandant of the School, presented the graduation certificates, and General McCallam presented the Hoskins Memorial Medal to the most outstanding student, Major William E. Rothe. This medal is given each year by the AVMA to the student with the highest general scholastic average.

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Captain Lopez Awarded Bronze Star.—A Bronze Star and Air Medal were presented to

Captain Robert A. Lopez

Capt. Robert A. Lopez (COR '45), chief of preventive medicine and veterinary services, "for meritorious service in connection with military operations against the enemy . . ." and "for meritorious achievement while participating in the aerial flight during the period 13 Feb. 52 to 15 Aug. 52." Among many other awards and decorations, Captain Lopez has also received the Republic of Korea Presidential Unit Citation.

MARRIAGE

Dr. (ONT '49) John E. Sterns and Miss Dorothy Joan Hayes, R.N., of Fredericton, N. B., were married at St. Anthony's Church in Fredericton on June 12, 1954. They honeymooned in Kentucky.

BIRTHS

Dr. (WSC '50) and Mrs. Robert P. Brimble, Gresham, Ore., announce the birth of a son, Randy Scott, on June 7, 1954.

Dr. (OKL '52) and Mrs. Finis E. Hilton, St. Paul, Minn., announce the birth of twin sons, Gerald Finis and James Anthony, on June 26, 1954.

DEATHS

★**Harry W. Barnard** (UP '09), 80, Lancaster, Pa., died July 14, 1954. Dr. Barnard was a life member of the AVMA. An obituary appears on page 268 of this JOURNAL.

Emil L. Blumenshine (StJ '18), 67, Washington, Ill., died March 4, 1954. Dr. Blumenshine, a general practitioner, was a member of the Illinois State, Mississippi Valley, and Eastern Iowa Veterinary Medical Associations. He had been a member of the AVMA.

Edward A. Bower (GR '09), 88, Colon, Mich., died June 25, 1954. Dr. Bower, a general practitioner, had been in retirement for fifteen years.

Louis J. Christman (MCK '08), 75, Kankakee, Ill., died March 5, 1954. Dr. Christman, a general practitioner, had practiced in Kankakee for nearly fifty years.

Charles C. Dauber (ONT '04), Burr Oak, Mich., died in June 1953. Dr. Dauber was a general practitioner.

William L. Drinkwater (ONT '06), 91, Utica, Mich., died on March 22, 1954. Dr. Drinkwater had retired from practice several years ago.

Richard E. Gidley (KCV '12), 74, Shenandoah, Iowa, died Sept. 24, 1953. Dr. Gidley is survived by his widow and a daughter.

Dolie C. Hancock (IND '22), 61, Mays, Ind., died May 1, 1954. Dr. Hancock had practiced in Mays almost thirty years. He retired in 1949 due to ill health. He had been a member of the AVMA for many years.

Samuel Murray (ONT '04), Dublin, Ont., died (date unknown). Dr. Murray was a general practitioner.

B. Daniel Ortiz (MEX '14), Yucatan, Mex., died (date unknown). Dr. Ortiz had been a member of the AVMA.

Rafael A. Osorio (MEX '16), Mexico, D. F., Mex., died (date unknown). Dr. Osorio had been a member of the AVMA.

Frank Parker (ONT '84), Ogden, Utah, died in 1953. Dr. Parker had retired some time ago.

David F. Piper (CVC '14), Decatur, Ill., died Feb. 20, 1953. Dr. Piper was a general practitioner.

Frank L. Spillman (STJ '17), 58, Kansas City, Kan., died May 24, 1954. Dr. Spillman was a meat inspector for the U. S. Department of Agriculture.

Clifton W. Strode (KCV '16), 73, Ash Grove, Mo., died May 18, 1954. Dr. Strode was a member of the Missouri Veterinary Medical Association. He is survived by his widow, two sons, two daughters, and eight grandchildren.

Clarence G. Swindler (IND '08), Linden, Ind., died in April, 1954. Dr. Swindler was a general practitioner.

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COMING MEETINGS

Notices of Coming Meetings must be received by 4th of month preceding date of issue

Louisiana Veterinary Medical Association. Fall meeting. Lake Charles Country Club, Lake Charles, La., Sept. 8-9, 1954. R. B. Lank, Department of Veterinary Science, Louisiana State University, Baton Rouge, La., secretary.

New Mexico Veterinary Medical Association. Annual meeting. La Fonda Hotel, Santa Fe., N. M., Sept. 13-14, 1954. Joe M. Miller, Box 149, Alamogordo, N. M., secretary.

Northeast Mississippi Veterinary Medical Association. Annual clinic. Dr. W. L. Stroup's Clinic, Corinth, Miss., Tuesday, September 14, 1954. G. B. Bradshaw, Macon, Miss.

New York State Veterinary Medical Society. Annual meeting. Saranac Inn, Saranac, N. Y., Sept. 15-17, 1954. Joan S. Halat, Utica, N. Y., acting executive secretary.

Conference for Veterinarians. Alabama Polytechnic Institute, Auburn, Ala., Sept. 16-18, 1954. R. S. Sugg, dean, School of Veterinary Medicine, Alabama Polytechnic Institute, Auburn, Ala.

Northern Illinois Veterinary Medical Association. Fall meeting. Hotel Faust, Rockford, Ill., Sept. 22, 1954. J. W. Boller, Harvard, Ill., secretary.

Missouri, University of. Short course for veterinarians. School of Veterinary Medicine, University of Missouri, Columbia, Mo., Oct. 4-5 1954. Cecil Elder, chairman.

Purdue University. Annual short course for veterinarians. Department of Veterinary Science, Purdue University, Lafayette, Ind., Oct. 6-8, 1954. L. M. Hutchings, chief veterinarian.

Wisconsin, University of. Postgraduate conference for veterinarians. University of Wisconsin, Madison, Wis., Oct. 7-8, 1954. C. A. Brandly, chairman, Department of Veterinary Science.

New England Veterinary Medical Association. Annual meeting, New Ocean House, Swampscott, Mass., Oct. 7-9, 1954. C. Lawrence Blakely, 180 Longwood Ave., Boston 15, Mass., secretary.

Pennsylvania State Veterinary Medical Association. Annual meeting. Pocono Manor Inn, Pocono Manor, Pa., Oct. 13-15, 1954. R. C. Snyder, Walnut St. and Copley Rd., Upper Darby, Pa., secretary.

Eastern Iowa Veterinary Association. Annual meeting. Montrose Hotel, Cedar Rapids, Iowa, Oct. 14-15, 1954. Wayne H. Thompson, Earlville, Iowa, secretary.

South Dakota Veterinary Medical Association. Annual meeting. Cataract Hotel, Sioux Falls, S. Dak., Oct. 14-15, 1954. J. L. Noordsy, Marion, S. Dak., secretary.

Southern Veterinary Medical Association. Annual meeting. Geo. Vanderbilt and Battery Park Hotels, Asheville, N. Car., Oct. 18-20, 1954. H. L. Seelig, 111 Broadway, Asheville, N. Car., publicity chairman.

Department of Health, Education, and Welfare, in coöperation with the journal, *Antibiotics and Chemotherapy*. Symposium on Antibiotics. Washington, D. C., Oct. 20-22, 1954. Henry Welch, chairman.

Illinois, University of. Annual veterinary conference and short course. College of Veterinary Medicine, University of Illinois, Urbana, Ill., Oct. 21-22, 1954. L. E. Boley, chairman.

Mississippi Valley Veterinary Medical Association. Annual meeting. Pere Marquette Hotel, Peoria, Ill., Oct. 27-28, 1954. William L. Beer, 612 N. College Ave., Aledo, Ill., secretary.

Interstate Veterinary Medical Association. Annual meeting. Martin Hotel, Sioux City, Iowa, Oct. 28-29, 1954. K. W. Smith, 510 West 19th St., Sioux City, Iowa, secretary.

West Virginia Veterinary Medical Association. Annual meeting. Hotel Morgan, Morgantown, W. Va., Oct. 31-Nov. 1, 1954. Elvin R. Coon, 346 Capitol Building, Charleston 5, W. Va., secretary.

New York State College of Agriculture at Cornell University. Annual nutrition conference for feed manufacturers. Statler Hotel, Buffalo, N. Y., Nov. 4-5, 1954. M. L. Scott, Rice Hall, Cornell University, Ithaca, N. Y., chairman.

Southwest Veterinary Medical Symposium. New Hilton Hotel, Fort Worth, Texas, Nov. 5, 1954. Drue S. Ward, 2816 W. Lancaster, Fort Worth 7, Texas, program chairman.

(*Continued on p.* 24)

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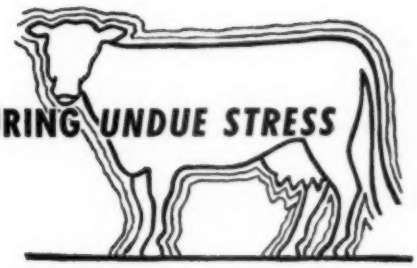

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(COMING MEETINGS—*continued from p. 22*)

U. S. Livestock Sanitary Association. Annual meeting. Hotel Fontenelle, Omaha, Neb., Nov. 10-12, 1954. R. A. Hendershott, 1 West State Street, Trenton 8, N. J., secretary.

American Animal Hospital Association (regional) and Midwest Small Animal Association. Hotel Burlington, Burlington, Iowa, Nov. 10-11, 1954. J. Porter Coble, 2828 S. MacArthur Blvd., Springfield, Ill., secretary.

Nebraska State Veterinary Medical Association. Annual meeting. Hotel Cornhusker, Lincoln, Neb., Dec. 1-3, 1954. W. T. Spencer, 1250 North 37th Street, Lincoln, Neb., secretary.

Armed Forces Institute of Pathology. Short Course. Armed Forces Institute of Pathology, Washington 25, D. C., Dec. 6-10, 1954. Brig. Gen. Elbert DeCoursey, M.C., U. S. Army, director.

New York State Veterinary College. Annual conference for veterinarians. New York State Veterinary College, Cornell University, Ithaca, N. Y., Jan. 5-7, 1955. W. A. Hagan, dean.

Ohio State Veterinary Medical Association. Annual meeting. Deshler-Hilton Hotel, Columbus, Ohio, Jan. 5-7, 1955. William S. Konold, 50 East Broad Street, Columbus 15, Ohio, executive secretary.

Kansas Veterinary Medical Association. Annual convention. Town House Hotel, Kansas City, Kan., Jan. 6-8, 1955. K. Maynard Curts, 70 Central Ave., Kansas City 18, Kan., secretary.

Tennessee Veterinary Medical Association. Annual meeting. Knoxville, Tenn., Jan. 9-11, 1955. H. W. Hayes, 734 Broadway, North East, Knoxville, Tenn., secretary.

Indiana Veterinary Medical Association. Annual meeting. Hotel Severin, Indianapolis, Ind., Jan. 12-14, 1955. W. W. Garverick, Zionsville, Ind., secretary.

Iowa Veterinary Medical Association. Annual meeting. Hotel Fort Des Moines, Des Moines, Iowa, Jan. 18-20, 1955. F. B. Young, Waukee, Iowa, executive secretary.

Minnesota State Veterinary Medical Society. Annual meeting. Hotel Nicollet, Minneapolis, Minn., Jan. 24-26, 1955. B. S. Pomeroy, School of Veterinary Medicine, University of Minnesota, St. Paul 1, Minn., secretary.

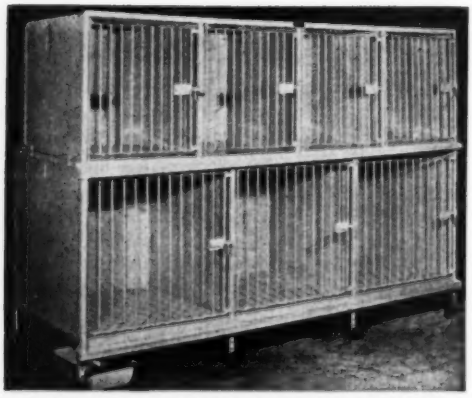
American Animal Hospital Association. Annual meeting. Hotel Statler, Detroit, Mich., May 4-7, 1955. Wayne H. Riser, Skokie, Ill., executive secretary.

Foreign Meetings

Pan-African Days for Zootechnology. First meeting. Algiers, Algeria, Oct. 17-23, 1954. R. Camov, 3 Rue Péllissier, Algiers, Algeria, general secretary of the Societe Veterinaire de Zootechnie D'Algerie.

(*Continued on p. 26*)

DE LUXE CAGES AND DOG DRYER



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Shorten my nose...? I should say not!

Me, I'm pleased as Punch about the length of my nose. For with us beagles, noses are as important as muscles to a circus strongman. Shorten my nose and I'm out of business—and maybe my owner is, too.

Now I've got a litter of young 'uns due in a spell, and, mother that I am, I want 'em to grow up perfect —noses and all. Thank Heaven I don't have to worry on that score. Overheard the boss talking to another kennel owner the other day. He said, "I breed to win, and I can't take chances on feeding a deficient diet that might retard the skeleton growth of my pups. That's why I feed the best—and for my money, that's Ken-L-Meal." . . . Thanks, boss!

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Fill one dish with KEN-L-MEAL and a *second* dish with any other dog meal. Watch your dog "sniff" the air and head straight for the KEN-L-MEAL! It's KEN-L-MEAL's *real meat meal aroma* dogs go for! Notice, too, KEN-L-MEAL absorbs water almost instantly—and retains a crumbly, moist texture.

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Pups are fun, raising a champ is a rewarding experience, training and stud services are profitable. But it's still a business—and to stay in business you have to breed to win.

Breeding to win means feeding pups, champs, and stud dogs Ken-L-Meal because what you breed in, Ken-L-Meal will bring out.

That's because Ken-L-Meal not only contains real meat meal, but all the minerals, vitamins, and other nutrients known to be essential to maintain dogs in robust health and peak vigor. All dogs thrive on it—and it's easy on your purse as well. Just a few cents a day feeds a 20-lb. dog.

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Write at once for an application and descriptive folder.

American Veterinary Medical Association

600 So. Michigan Ave., Chicago 5, Ill.

(COMING MEETINGS—*continued from p. 24*)

Regularly Scheduled Meetings

Atlanta Veterinary Society, the first Tuesday of every month. C. L. Bromley, Jr., 1634 Northside Dr., Atlanta Ga., secretary.

Baltimore City Veterinary Medical Association, the second Thursday of each month, September through May (except December), at 9:00 p.m. at the Park Plaza Hotel, Charles and Madison Streets, Baltimore, Md. Victor I. Sorgen, 133 Wiltshire Rd., Baltimore 21, Md., secretary.

Bay Counties Veterinary Medical Association, the second Tuesday of each month. George W. Eberhart, El Cerrito, Calif., secretary.

Cedar Valley Veterinary Association, the second Monday of each month, except July and August, at Black's Tea Room, Waterloo, Iowa. D. A. Buchanan, Grundy Center, Iowa, secretary.

Central California Veterinary Medical Association, the fourth Tuesday of each month. Herbert Piper, 4990 Ventura Ave., Fresno, Calif., secretary.

Central Carolina Veterinary Medical Association, the second Wednesday of each month at 7:00 p.m. in the O'Henry Hotel in Greensboro. Dr. J. S. Ellis, 2450 Battleground Ave., Greensboro, N. Car., secretary.

Chicago Veterinary Medical Association, the second Tuesday of each month. Wayne H. Riser, 5335 Touhy Ave., Skokie, Ill., secretary.

Coastal Bend Veterinary Association (Texas), the second Wednesday of each month. J. E. Hoban, 4301 S. Port Ave., Corpus Christi, Texas, secretary.

Coon Valley Veterinary Association, the second Wednesday of each month, September through May, at the Bradford Hotel, Storm Lake, Iowa. J. R. Rosdail, Pomeroy, Iowa, secretary.

Cuyahoga County (Cleveland, Ohio) Veterinary Medical Association, the first Wednesday of each month—September through May (except January)—at 9:00 p.m. at the Carter Hotel, Cleveland, Ohio. Roger W. Grundish, 4217 Mayfield Road, South Euclid 21, Ohio, secretary.

East Bay Veterinary Medical Association, bimonthly, the fourth Wednesday. Robert Clemens, 23352 Orchard, Hayward, Calif., secretary.

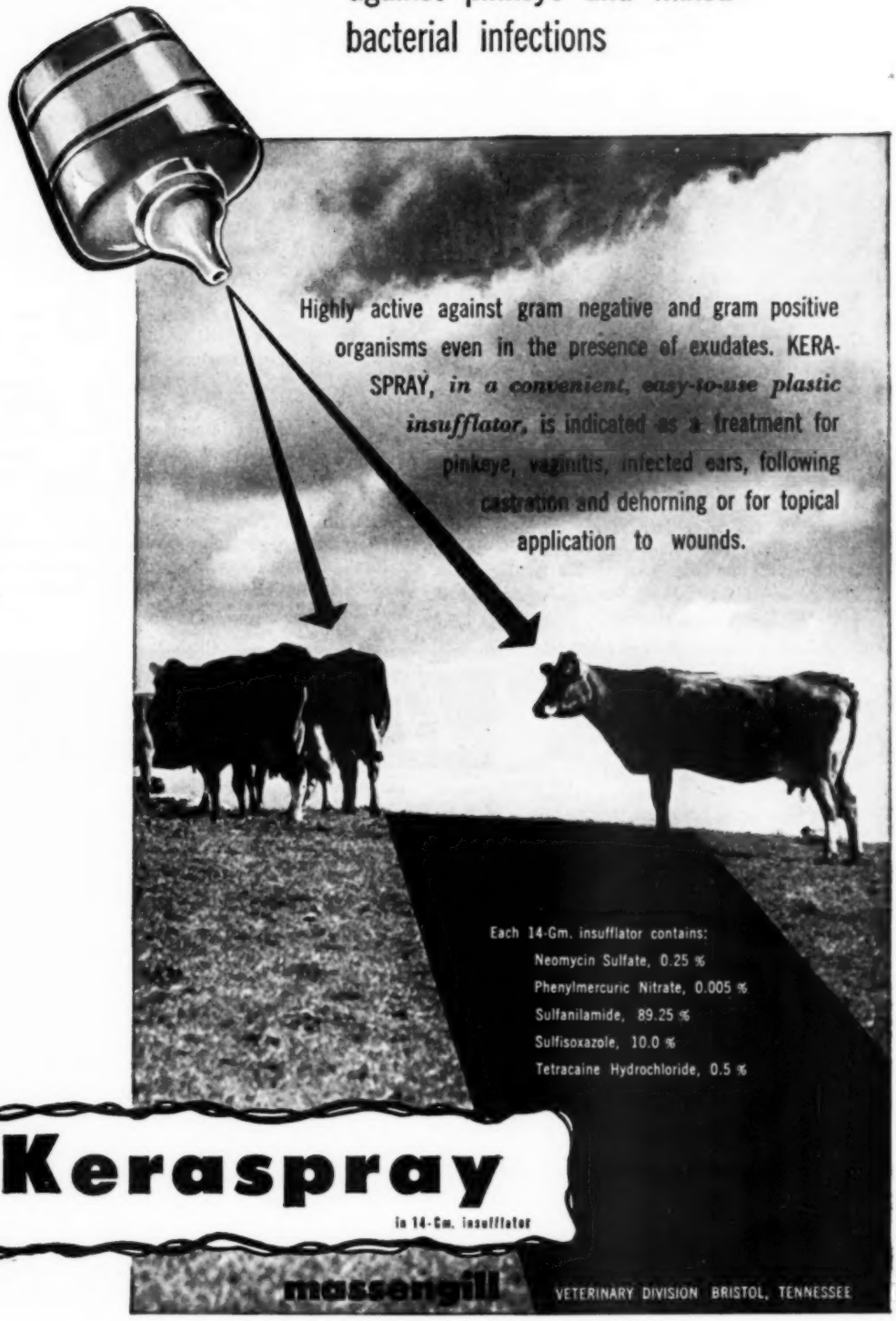
Eastern Illinois Veterinary Medical Association, the first Thursday of March, June, September, and December. A one-day clinic is held in May. L. E. St. Clair, College of Veterinary Medicine, University of Illinois, Urbana, Ill., secretary.

Eastern North Carolina Veterinary Medical Association, the first Friday of each month, time and place specified monthly. C. B. Randall, Kinston, N. Car., secretary.

(*Continued on p. 28*)

broader activity . . .

against pinkeye and mixed bacterial infections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in 14-Gm. insufflator
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Fayette County Veterinary Association, Iowa, the third Tuesday of each month, except in July and August, at Pa and Ma's Restaurant, West Union, Iowa. Donald E. Moore, Box 178, Decorah, Iowa, secretary.

Florida, North-East Florida Veterinary Medical Association, the second Thursday of each month, time and place specified monthly. J. O. Whiddon, 829 San Marco Blvd., Jacksonville, Fla.

Greater St. Louis Veterinary Medical Association, the first Friday of the month (except July and August) at the Sheraton Hotel, Spring Ave. and Lindell Blvd. Luther E. Fredrickson, Room 11, Municipal Courts Bldg., St. Louis, Mo., secretary.

Houston Veterinary Medical Association, Houston, Texas, the first Thursday of each month. Edward Lepon, Houston, Texas, secretary-treasurer.

Illinois Valley Veterinary Medical Association, the second Sunday evening of even-numbered months at the Jefferson Hotel, Peoria, Ill. S. M. McCully, Lacon, Ill., secretary.

Indiana Tenth District Veterinary Medical Association, third Thursday of each month. L. A. Snider, New Palestine, Ind., secretary.

Jefferson County Veterinary Society of Kentucky, Inc., the first Wednesday evening of each month, in Louisville or within a radius of 50 miles. Dr. W. E. Bewley, P.O. Box "H", Crestwood, Ky., secretary.

Kansas City Small Animal Hospital Association, the first Monday of each month, at the Hotel Continental. J. A. Zacher, 3632 Main St., Kansas City, Mo., secretary.

Kansas City Veterinary Medical Association, the third Tuesday of each month, at the Exchange Hall, Ninth Floor, Livestock Building, 1600 Genesee, Kansas City, Mo. J. C. Davis, 7332 Canterbury St., Kansas City 13, Mo., secretary.

Kern County Veterinary Medical Association, the first Thursday of each month. R. A. Stiern, 17 Niles St., Bakersfield, Calif., secretary.

Keystone Veterinary Medical Association, the Philadelphia County Medical Society Building, 301 S. 21st Street, Philadelphia, Pa., on the fourth Wednesday of each month. Raymond C. Snyder, 39th and Woodland Ave., Philadelphia 4, Pa., secretary.

Kyowva Veterinary Medical Association, the second Thursday of each month in the Hotel Prichard, Huntington, W. Va., at 8:30 p.m. Karl Mayer, 1531 Fourth Ave., Huntington, W. Va., secretary.

Maricopa County Veterinary Association, the second Tuesday of each month. Charles J. Prchal, 1722 East Almeria Road, Phoenix, Ariz., secretary.

Metropolitan New Jersey Veterinary Medical Association, the third Wednesday evening of each month from September through May, at the Academy of Medicine of Northern New

(*Continued on p. 30*)

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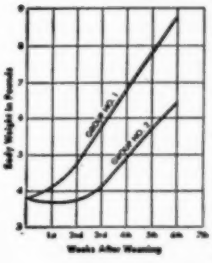
GIVE PUPPIES A FAST START!

feed KASCO now made with antibiotics

THE time of slowest growth in puppies is during and just after weaning. These weeks are the most critical in a puppy's life. But with antibiotics in their diet, puppies respond like magic. Their increase in growth after weaning is amazing—they develop finer coats, are more active and in better all-around condition.

Now—*without* extra cost or extra work—you can take advantage of this latest nutritional discovery, because Kasco contains antibiotics.

Compare the Growth



The two groups of puppies whose growth is shown on the chart received identical diets (Kasco Complete Dog Ration and water) with one exception. Group No. 1 received antibiotics in their diets. Group No. 2 didn't.

Notice the steady, rapid growth of Group No. 1—how it shot ahead of Group No. 2. Notice the difference in weights six weeks after weaning.

These are the kind of growth results you can expect in puppies if you feed Kasco.

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Tests have proven definitely that antibiotics DO NOT affect the size of a dog at maturity. They do NOT affect total growth—but do speed up growth during the critical weeks after weaning.

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Jersey, 91 Lincoln Park South, Newark, N. J. Myron S. Arlein, 2172 Millburn Ave., Maplewood, N. J., secretary.

Michiana Veterinary Medical Association, the second Thursday of each month, at the Hotel LaSalle, South Bend, Ind. Paul W. Hough, 829 Bryan St., South Bend, Ind., secretary.

Michigan, Southeastern Veterinary Medical Association, the second Thursday of every month, September through May. Gilbert Meyer, 14003 E. Seven Mile Road, Detroit 5, Mich., secretary.

Mid-Coast Veterinary Medical Association, the first Thursday of every even month. George McCollister, 2146 Broad St., San Luis Obispo, Calif., secretary.

Milwaukee Veterinary Medical Association, the third Tuesday of each month, at the Half-Way House, Blue Mound Rd. George F. Lynch, 201 West Devon St., Milwaukee 17, Wis., secretary.

Mobile-Baldwin Veterinary Medical Association, the first Tuesday of each month at the Hotel Admiral Simmes, Mobile, Ala. C. Eric Kennedy, Mobile, Ala., secretary.

Monterey Bay Area Veterinary Medical Association, the third Wednesday of each month. Lewis J. Campbell, 66 Marion Ave., Salinas, Calif., secretary.

New Castle County (Del.) Veterinary Association, the first Tuesday of each month at 9:00 p.m. in the Hotel Rodney, Wilmington, Del. Arthur P. Coogan, 2102 New Road, Wilmington 5, Del., secretary.

New York City, Veterinary Medical Association of, the first Wednesday of each month at the New York Academy of Sciences, 2 East 63rd St., New York City. C. E. DeCamp, 43 West 61st St., New York 23, N. Y., secretary.

Northern Colorado Veterinary Medical Association, the second Monday of each month. William D. Carlson, P.O. Box 478, Fort Collins, Colo., secretary.

Northern New Jersey Veterinary Association, the fourth Tuesday evening from September through June, at the Casa Mana Restaurant, Cedar Lane, Teaneck, N. J. Robert R. Shomer, 1680 Teaneck Road, N. J., secretary.

Northern San Joaquin Valley Veterinary Medical Association, the fourth Wednesday of each month. Tom Hagan, Gen. Del., Escalon, Calif., secretary.

Oklahoma County Veterinary Medical Association, the second Wednesday of every month except August and July. R. J. Keller, 1701 N. Highland Drive, Oklahoma City, Okla., secretary.

Orange Belt Veterinary Medical Association,

(*Continued on p. 32*)

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(COMING MEETINGS—*continued from p. 30*)

the second Monday of each month at 7:00 p.m. in the Antlers Hotel, San Bernardino, Calif. William J. Kelber, 1111 West A St., Ontario, Calif., secretary.

Orange County Veterinary Medical Association, bi-monthly. Donald E. Lind, 2643 N. Main, Santa Ana, Calif., secretary.

Peninsula Veterinary Medical Association, the third Monday of each month. P. H. Hand, Box 1035, Millbrae, Calif., secretary.

Piedmont Veterinary Medical Association, the last Friday of each month at 7:00 p.m. in Mull's Motel in Hickory, N. Car. G. V. McCranie, Hickory, N. Car., secretary.

Pima County (Arizona) Veterinary Medical Association, the third Wednesday of each month, in Tucson. R. W. Adami, 2103 S. 6th Ave., Tucson, Ariz., resident secretary.

Portland (Oregon) Veterinary Medical Association, the second Tuesday of each month, in the Auditorium of the Upjohn Company. Victor T. Oliver, 9705 S.W. Barbur Blvd., Portland 19, Ore., secretary.

Redwood Empire Veterinary Medical Association, the third Thursday of each month. H.

(*Continued on p. 34*)

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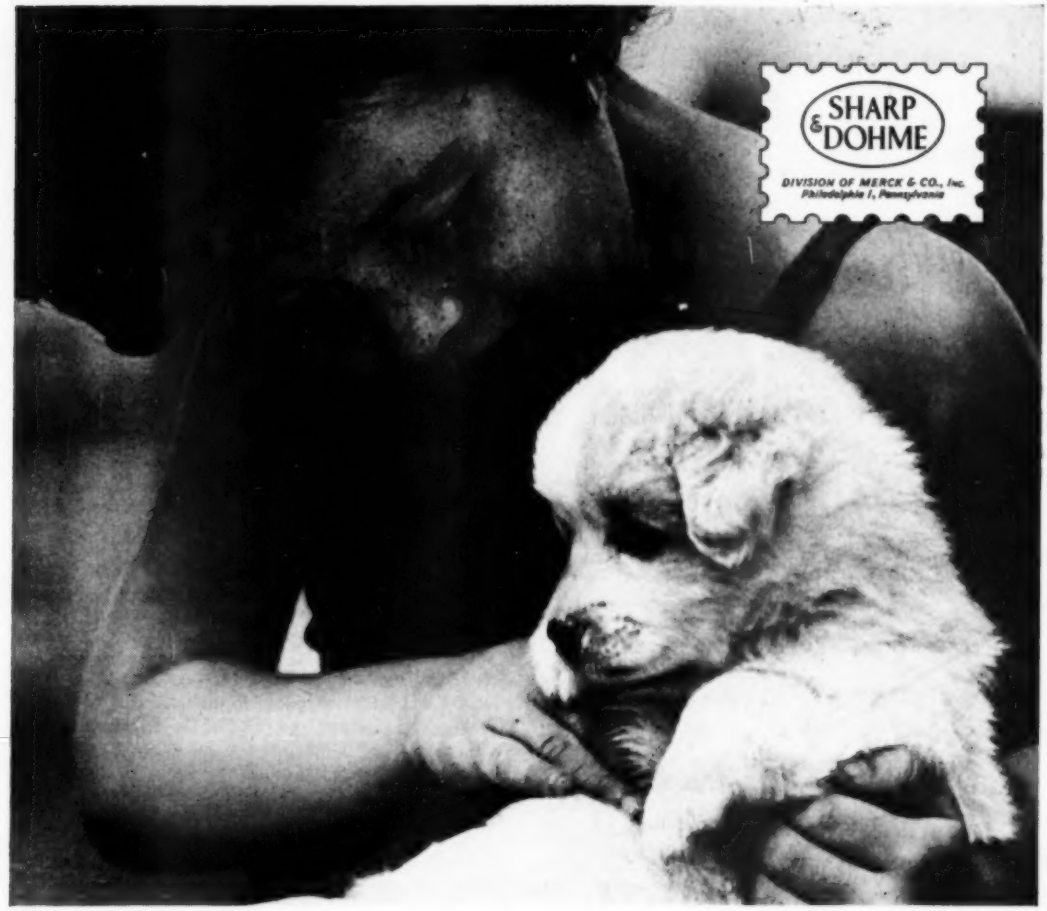

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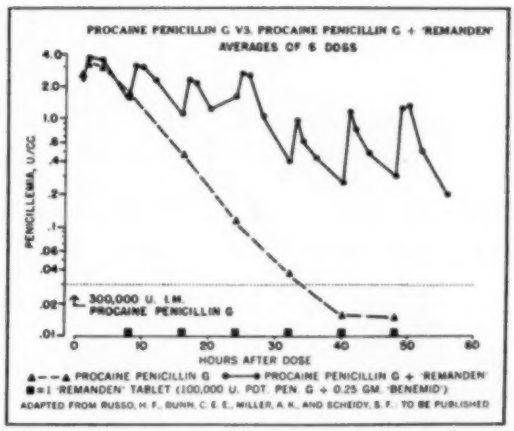

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(COMING MEETINGS—*continued from p. 32*)

M. Strandberg, 203 D St., Petaluma, Calif., secretary.

Sacramento Valley Veterinary Medical Association, the second Wednesday of each month. S. M. Foster, 430 College, Woodland, Calif., secretary.

Saginaw Valley Veterinary Medical Association, the last Wednesday of each month. F. Ferguson, 1702 S. Dort Highway, Flint, Mich., secretary.

San Diego County Veterinary Medical Association, the fourth Tuesday of each month except July and August. E. R. Quortrup, 4005 Rosecrans St., Building 2, San Diego, Calif., secretary.

San Fernando Valley (California) Veterinary Medical Association, the second Friday night of each month at Eaton's Restaurant in Studio City, Calif. Howard C. Taylor, 2811 W. Olive Ave., Burbank, Calif., secretary.

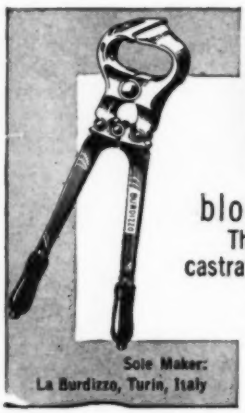
Santa Barbara-Ventura Counties Veterinary Medical Association, Friday evenings every sixth week. Dee Wodars McDermott, 5879 Hollister, Coleta, Calif., secretary.

Seattle Veterinary Medical Association, the third Monday of each month in the home of Dr. Fred Cummings, 5828-5th, N.W., Seattle, Wash.

Southern California Veterinary Medical Association, the third Wednesday of each month. Rankin W. McIntyre, 203 Administration Building, Union Stockyards, Los Angeles, Calif., secretary.

South Florida Veterinary Society, the third Tuesday of each month, at the Seven Seas Restaurant, Miami, Fla. E. A. Majilton, 1093 N. E. 79th St., Miami, Fla., secretary.

Tulsa Veterinary Medical Association, the third Thursday of each month, in Director's Parlor of the Brookside State Bank, Tulsa, Okla. John Carnes, Muskogee, Okla., secretary.



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In the study on turkey poults experimentally infected with S. gallinarum, Furoxone reduced the mortality to zero, compared to 85 to 90% mortality among untreated controls.[1]

In chickens experimentally infected with S. gallinarum, Furoxone held deaths to a level of 0 to 3%, as compared to 70% mortality among controls.[2]

In a field study on over 10,000 chickens and 7,000 turkeys with high mortality rates from epizootics of typhoid (S. gallinarum), Furoxone reduced the mortality to approximately 7% and 2% respectively.[3]

Studies to be published reveal comparable effectiveness of Furoxone against S. pullorum in chickens and S. typhimurium in turkeys.

1. Grumbles, L. C., Wills, F. K. and Boney, W.A.: J. Am. Vet. M. A. 124: 217, 1954.
2. Smith, H. W.: Vet. Rec. 66: 215, 1954.
3. Cosgrove, A. S.: Vet. Med. In press.

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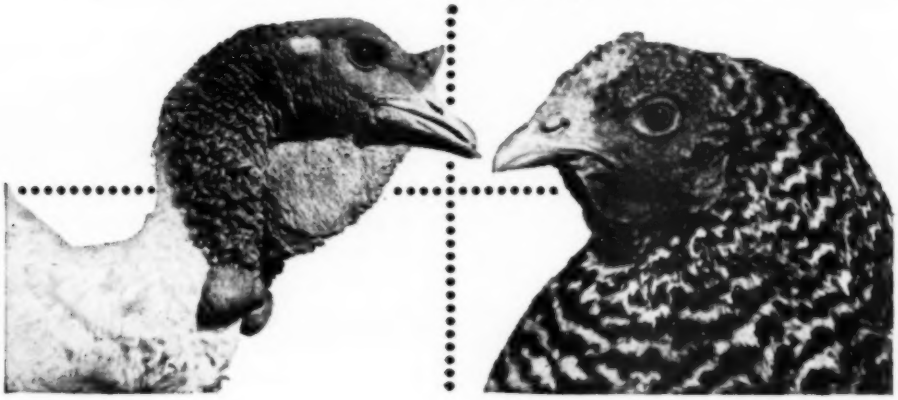


CLASSIFIED ADVERTISEMENTS

Twenty-five words or less, $2.50; 8 cents for each additional word. Replies sent in care of the JOURNAL, 25 cents extra.

Remittance must accompany order.

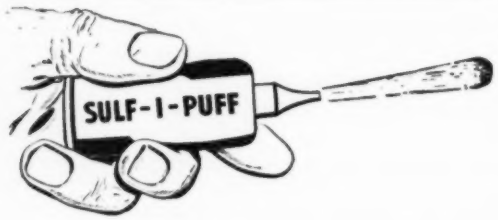
Deadline for want ads 8th of month preceding date of issue.

Names of classified advertisers using key letters can not be supplied. Address your reply to the key letters, c/o JOURNAL of the AVMA, 600 S. Michigan Ave., Chicago 5, Ill., and it will be transmitted to the advertiser.

Wanted—Veterinarians

Veterinarian wanted as assistant in small animal practice. License in Virginia required. Salary plus percentage. Address "Box D 1," c/o JOURNAL of the AVMA.

Assistant wanted for Chicago small animal hospital, male or female. Must be capable of grooming and assisting in general care of pets. Apartment furnished. State qualifications and salary expected; references required. Address "Box D 2," c/o JOURNAL of the AVMA.



for
Surface Wounds
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Eye Infections
New Improved Formula and Package

Sulfanilamide 32%, Sulfathiazole 16%,
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Finely powdered, will not clog nozzle of new style round durable plastic puffer bottle

doz ½ ounce....5.45 6 doz....30.00

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Pharmaceutical Manufacturers to the Veterinary Profession - Since 1918

CURTS *Laboratories*

KANSAS CITY, KANSAS

Experienced veterinarian wanted for 1 year to conduct mixed practice with small animal hospital in Middlewest. Purchase drugs and lease completely furnished. Option to re-lease or purchase part or all. Established practice; $2,500 will handle to start. Address "Box D 10," c/o JOURNAL of the AVMA.

Veterinarian wanted to operate and to have complete charge of small animal clinic and hospital. Apartment furnished; excellent salary with commission on gross business. Position open November first; references required. Address Barrett and Noonan, 490 E. Cuyahoga Falls Ave., Akron 10, Ohio.

Director wanted for newly inaugurated state-wide meat insection service. Applicant must have four years' general professional experience including two years in meat inspection and be eligible for Virginia licensure. Position requires technical and administrative ability to direct program. Liberal vacation, sick leave, and retirement allowances. Salary, $5,880-7,344. Address Director of Personnel, Virginia State Health Department, Richmond 19, Va.

Assistant wanted for mixed practice in Nebraska; $400 for three months; commission or percentage if satisfactory. Permanent arrangement end of 1 year. You furnish car. Address "Box D 11," c/o JOURNAL of the AVMA.

Experienced veterinarian wanted to assist in small animal hospital in West Virginia; 10% large animals. Address "Box D 19," c/o JOURNAL of the AVMA.

Remittance must accompany advertisement

Veterinarian wanted to assist in small animal hospital in suburb of large Pennsylvania city; Pennsylvania license needed. Excellent opportunity for capable man; apartment available. In reply give full particulars, experience, and salary expected. Address "Box D 20," c/o JOURNAL of the AVMA.

Opportunity for veterinarian with Connecticut license and some capital to establish himself, build up his own practice, and buy into a hospital; near New York state line. Address "Box D 21," c/o JOURNAL of the AVMA.

(*Continued on p.* 38)

Marketing Manager Wanted for Veterinary Products

Prominent ethical pharmaceutical manufacturer, about to enter field of veterinary medicine, seeks man with organizational ability and sound knowledge of market to create new division. Please send complete resume. Address

"Box D 17," c/o JOURNAL of the AVMA.

Feed it
Prescribe it with
Confidence

Formerly
Peebles Dog-Kit

- **For underweight, ailing or old dogs**
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Peebles DOG MILK formula is designed expressly for canines and other carnivores: high in fat, low in lactose, amply fortified with vitamins and minerals.

CONCENTRATED—JUST ADD WATER **DOGS LIKE PEEBLES**

Sold by Veterinarians and Pet Shops

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Bovine and Equine

Safety

MOUTH SPECULUM

- Safety locking feature withstands 800 lbs pressure.
- Allows adequate room for inserting arm from either side.
- Attachment available for passing stomach tube through mouth makes this operation simpler and more humane.

Price $57.50 POST PAID For stomach tube attachment add $15

Sold to veterinarians only by makers of famous MacAllan Ear-Cropping Forms. Send check or money order, or phone Lansing 2-3797.

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CATS and kittens

Train themselves naturally

with KITTY LITTER

— a specially processed material which takes the place of messy sand and requires less frequent replacement.

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It is clean, sanitary, disposable . . . easy to use, economical . . . harmless to pets. A 5-lb. package lasts several weeks. Sold and used by leading veterinarians and cat owners everywhere.

ASK FOR NAME OF NEAREST JOBBER.

Free Literature on Request

LOWE'S, INC. Cassopolis, Mich.

Write Dept. 910

(CLASSIFIED ADS—*continued from p. 36*)

Wanted—Positions

German veterinarian, single, speaks English, graduated University of Munich, desires assistantship, possibly in small animals, also mixed practice, or anything related. Address "Box D 12," c/o JOURNAL of the AVMA.

Graduate of approved school, 1951, with experience in small animal and mixed practice, seeks permanent position. Available at once. Address "Box D 15," c/o JOURNAL of the AVMA.

Graduate of The Vienna Veterinary College. 1954, (graduates of this year are recommended by AVMA for recognition by State Boards and other agencies) desires position in busy practice; broad experience in large and small animals. Three years in the United States, speaks good English, best references. Address "Box D 16," c/o JOURNAL of the AVMA.

Graduate AVMA-approved school, 1953, licensed in Massachusetts, desires position with small animal practitioner. One year's experience; married, 32 years old. Address "Box D 23," c/o JOURNAL of the AVMA.

Position wanted leading to lease, partnership, or sale in mixed or small animal practice, preferably in North Carolina or Virginia; 1½ years of experience in mixed practice. Age 31, married. Address "Box D 26," c/o JOURNAL of the AVMA.

A 1953 graduate, AVMA-approved school, 1 year of experience in all phases of small animal practice, desires position in small animal or mixed practice leading to purchase, partnership, lease, or permanent employment. Licensed North Carolina, Florida, Virginia, New Jersey, and Massachusetts. Address "Box D 27," c/o JOURNAL of the AVMA.

Wanted—Practices

Large animal practice wanted. Will purchase or accept position leading to purchase. Prefer Minnesota or Wisconsin. Address "Box D 3," c/o JOURNAL of the AVMA.

Willing to invest in partnership or outright purchase of minimum 75% small animal practice in New Jersey. Wide experience; capable of full responsibility. Address "Box D 7," c/o JOURNAL of the AVMA.

Wanted to buy or lease, small animal hospital in Chicago, city or vicinity. Address "Box D 32," c/o JOURNAL of the AVMA.

(*Continued on p. 44*)

More dynamic for modern feeds

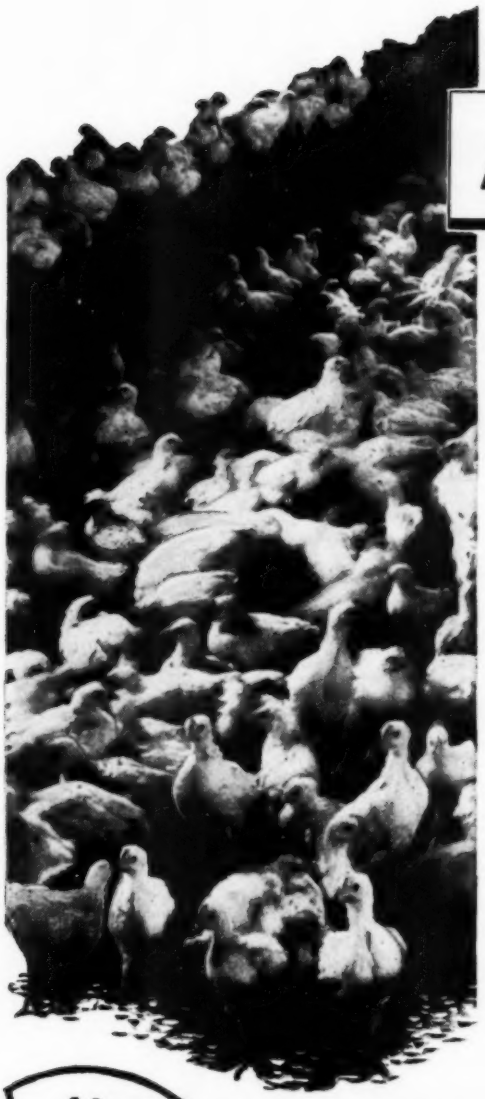
20%FOS.
DICALCIUM PHOSPHATE

INTERNATIONAL MINERALS & CHEMICAL CORPORATION
General Offices: 20 North Wacker Drive, Chicago 6, Ill.

mass relief

from PARASITIC INFESTATION with

ARECUTINE



POULTRY WORMER

• vermifuge • antiseptic • astringent

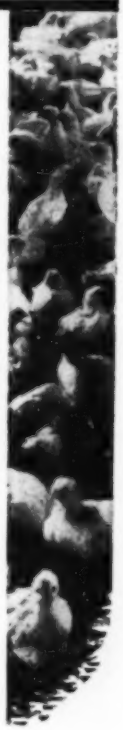
ARECUTINE is formulated for the elimination of Ascarids and the more common tapeworms and threadworms when the infestation is *multiple,* and when each fowl cannot be individually treated with specific anthelmintics.

Directions: Use one tablespoonful ARECUTINE to each gallon of drinking water. Allow no other water. Treatment should continue for two days. Repeat in 10 days. One gallon of medicated drinking water will worm approximately 20 adult birds.

Packaged—in sizes for your convenience:

12—8 oz. bottles
1—gal.

Look for the NLC trademark. It is your assurance of Tested Quality!



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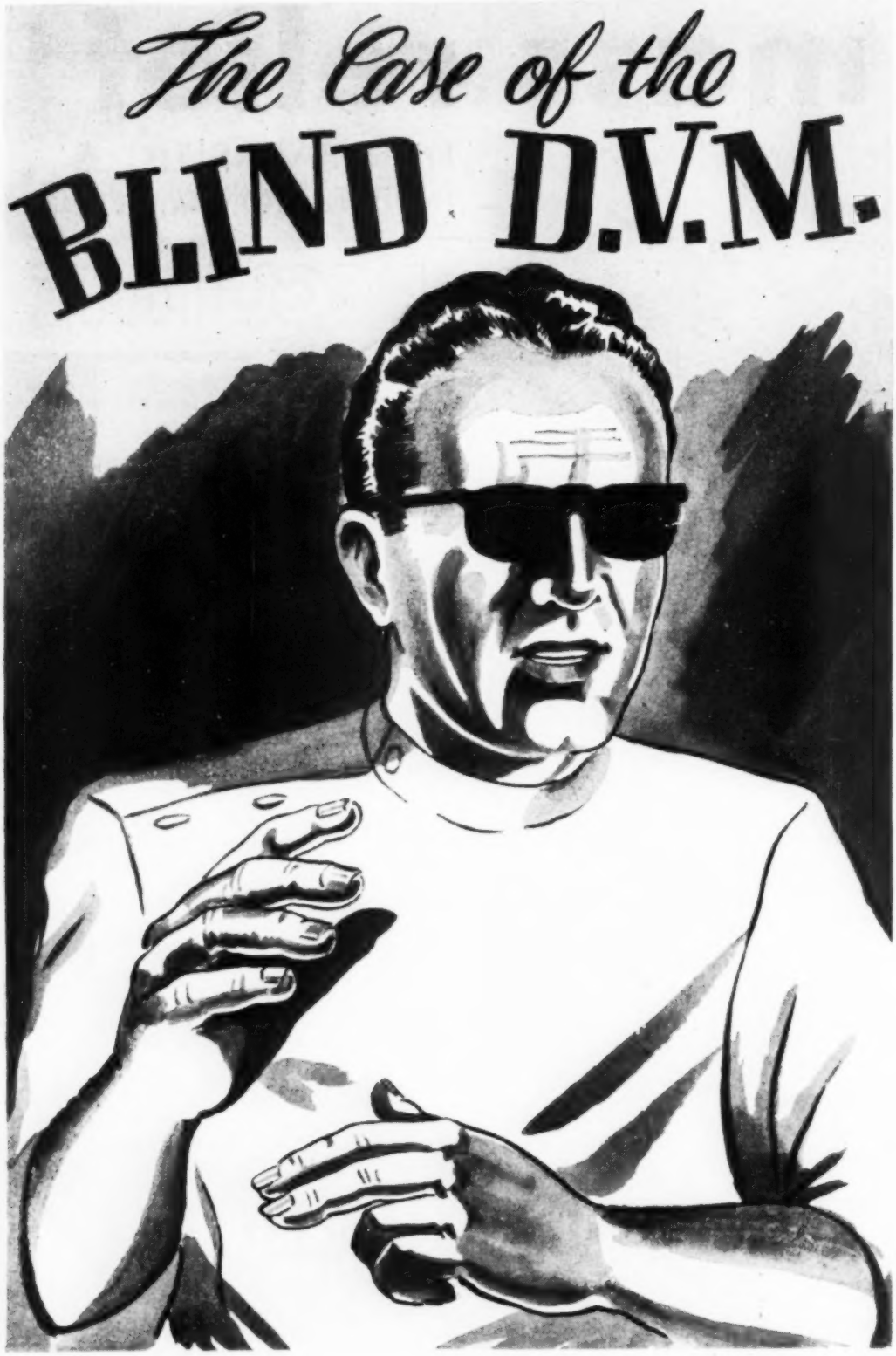
THE
NATIONAL LABORATORIES
CORPORATION
KANSAS CITY


The Case of the
BLIND D.V.M.

He's as good a veterinarian as ever earned a degree.

You'd never guess that he has a blind spot. He sees no difference between suppliers who sell to veterinarians only — and those who sell indiscriminately to retail outlets, animal owners, and other non-professional channels. Perhaps, some day, his eyes will be opened when he sees many of his clients treating their own animals, and attempting to diagnose from "interesting free literature".

Doctor! — Look back of the products you use — to the policies of the companies that supply them. When you buy from members of Associated Serum Producers, you are among proven friends. These companies sell exclusively to the veterinarian, and contribute their own funds to a nationwide public relations campaign and research program on behalf of the profession. Remember the names below when you place your orders.

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Norden Laboratories

Associated Serum Producers

Correspondence

July 2, 1954

Dear Editor:

We wish to comment on a statement made in the current [June, 1954:426] J.A.V.M.A. to the effect that cattle infected with *L. pomona* eliminate small numbers of the organism in the urine. It has been our experience *both in field studies and in experimentally induced infection that large numbers are often excreted.*

Of 22 calves ranging in age from 5 to 10 months that showed darkfield-positive urine, 5 *showed large numbers,* estimated in terms of millions per milliliter. One of these animals was particularly interesting. The urine of this animal contained more Leptospira than are observed in cultures with maximum populations. In this urine, "ballen," the largest of which covered an estimated 1/7th the diameter of the high-power field, were numerous.

Coincident with these observations, isolations of *Leptospira pomona* were readily secured from natural streams (2), and stagnant pools (4), to which the infected animals had access. In fact, samples from two pools showed leptospiral forms on darkfield examination.

Our experience in this connection with experimentally infected animals leads us to the same conclusion. The counting chamber has been employed for more accurate enumeration in some of these studies. *A bull calf* that contracted infection by exposure to diseased animals *passed urine* during an early stage of infection *that gave a count of approximately 45 million per milliliter.* The organism was isolated by culture of 10^{-7} dilution of this urine. As of this date, about three weeks later, somewhat similar numbers are being excreted. Direct counts can now no longer be made because of the agglutination of the organisms. Other experimental animals, including yearlings, have also eliminated comparable numbers of Leptospira. One, for instance, showed 22 million per milliliter.

Our experience leads us to believe that cattle constitute an *important* reservoir of infection. We feel that this view is strongly supported by the apparent ease of recovery of the organism from surface waters, presumably naturally contaminated by urine of infected cattle. Furthermore, *most of these ranches have no swine* to consider as possible reservoirs. [All italics are ours.—Ed.]

Yours very truly,

R. W. H. Gillespie, L. M. Ringen, S. G. Kenzy.

Model 4-3M for example, is supplied with either 1cc or 3cc glass liner, calibrated for deliveries within dual range of 0.1 to 1.0cc and 0.5 to 3.0cc respectively.
Automatic Pipettes for delivering up to 10cc also readily available!

Recognized By Technicians the World Over As Standard Laboratory Equipment

STERLING AUTOMATIC PIPETTE

(Motorized)

Technicians in veterinary laboratories throughout the world specify the STERLING AUTOMATIC PIPETTE. They recognize its everlasting accuracy and time-saving advantages.

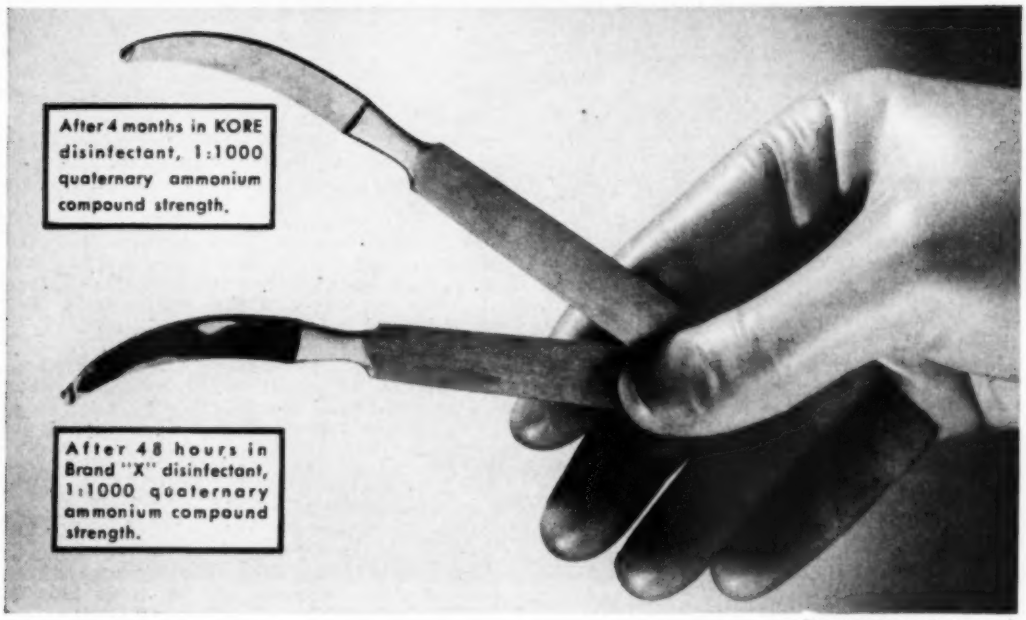
Write for FREE Bulletin VM-72.

Ivan Sorvall, Inc.

P.O. Box 230, Norwalk, Conn.

DISINFECT without RUSTING without DULLING cutting edges!

Here's VISIBLE PROOF


After 4 months in KORE disinfectant, 1:1000 quaternary ammonium compound strength.
After 48 hours in Brand "X" disinfectant, 1:1000 quaternary ammonium compound strength.

Unretouched photograph

KORE

Trade Mark

KORE will not rust or dull cutting edges!

KORE is formulated with a quaternary ammonium compound base* plus synergists which materially speed up killing action against a wide range of pathogenic micro-organisms.

Since KORE is a powder, its use both in the office and in the field is simple. Merely mix 1 tablespoonful in a quart of tap water.

KORE solutions are excellent for sterile storage of syringes and all instruments, including teat and ear instruments.

KORE comes in convenient 11-pound tins, or in 25, 50 and 100-pound drums. It is available from dealers throughout the United States.

* Para tertiary octyl phenoxy ethoxy ethyl dimethyl benzyl ammonium chloride.

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For Sale or Lease—Practices

Good, established large and small animal practice for sale in South Texas town of 7,000; 75% dairy practice. Includes 3-year-old house and clinic, cyclone fenced, beautifully landscaped; located one-half block from heart of town. Address "Box D 4," c/o JOURNAL of the AVMA.

Busy dog and cat hospital for sale; long established, lucrative practice on main thoroughfare in built up area Long Island, N.Y. Modern brick hospital, capacity 75. Ill health compels me to retire. Exceptional opportunity, 1 or 2 veterinarians. Address "Box D5," c/o JOURNAL of the AVMA.

For sale near Philadelphia, modern 6-room and bath stone house; 4-room and bath ranch house; stone kennel with quarters and runs for 10 dogs. Lot enclosed with 5-ft. fence. Commercial zoning. $45,000. Address Jackson-Cross Co., Realtors, 111 York Rd., Jenkintown, Pa.

Established general practice for sale. New modern 5-room hospital, fully equipped. Located in county seat of rich Indiana farming community. Grossing $20,000; hospital and practice priced, $16,500 cash. Address "Box D 8," c/o JOURNAL of the AVMA.

Partnership for sale in contemporary fully equipped small animal hospital at Dallas, Texas. Gross increased from $8,000 to $41,000 in five years. $22,500; $15,000 to handle. Address "Box D 9," c/o JOURNAL of the AVMA.

NOW available! Metal covered cases for your serums and instruments!

Our steel-sheathed cases for serums and instruments are really built to take the beating they get bumping around from farm to farm. Walls are made of heavy plywood, then covered with sheet steel. Black enamel finish is baked on. Corners heavily reinforced. Trim, latches, corner braces of solid brass.

Available in five standard styles ranging from $10.35 to $13.25 each, FOB Denver. Water-resistant lining, $1.75 extra per case. Write for full details on stock cases and custom built cases designed to your specifications. New illustrated folder showing NICHOLSON veterinary cases is just off the press.

For your copy, just address NICHOLSON Manfacturing, Inc., Box 7115, Denver 6, Colo.

NICHOLSON
precision veterinary equipment

Well-established mixed practice for sale in small northern California town. Artificial insemination unit; 3 acres, large house, compact small animal hospital. Netting $9,000 to $10,000; $11,000 down, balance in monthly payments. Address "Box D 13," c/o JOURNAL of the AVMA.

Active large animal practice for sale in Northern Iowa. Home, office attached, two-way radio, drugs, complete for $21,000. Possession immediately; selling due to allergy. Address "Box D 14," c/o JOURNAL of the AVMA.

Established mixed practice for sale in good dairy section of western New York. Will sell for value of real estate plus inventory of equipment and drugs wanted. Excellent terms. Only reason for selling—health factor. Address "Box V 13," c/o JOURNAL of the AVMA.

House and completely equipped 23-cage small animal hospital and individual runs for sale. Located in the beautiful resort area of Sullivan County in southeastern New York. Easy terms. Address "Box M 4," c/o JOURNAL of the AVMA.

Mixed practice for sale in city of 70,000. Hospital can be bought or leased. Sale price for drugs and equipment only. Address Bell Animal Clinic, Box 1671, Durham, N.C.

Large animal practice for sale in Minnesota; gross over $30,000. Home, office, drugs, and equipment. Reason for selling, health. Address "Box C 7," c/o JOURNAL of the AVMA.

Small animal hospital near Los Angeles, for sale. No real estate; 40-animal capacity. Gross $26,000; $12,500 cash or $13,500 terms with $5,000 minimum down. Address "Box W 17," c/o JOURNAL of the AVMA.

Mixed practice, predominantly dairy, for sale in northern California. Facilities for both large and small animals. Address "Box D 18," c/o JOURNAL of the AVMA.

Extensive mixed practice for sale in Middlewest. Well-equipped small animal hospital; adjacent residence. Well located. Present owner retiring. Address "Box B 12," c/o JOURNAL of the AVMA.

(*Continued on p. 48*)

BROKEN TEETH

—repaired in bottom clipper blades. Top and bottom blades sharpened to match. Save money—Guaranteed. Prices on Request

HIGHLY SPECIALIZED SHARPENING
Sales—Repairing on Oster and Stewart clippers.

Sharpened Blades Tested on Rabbit Fur

OSTER A 2 $.75 STEWART $1.00

Prompt Service—Est. 17 years

MAIL TO

CLIPPER SERVICE

It's DINNERTIME

FOR 22,500,000 DOGS!

. . . Yes, there are about 22,500,000 dogs in the United States today. And about 75% of these dogs are fed some kind of commercial dog food.

However, not only does the *amount* of commercial dog food fed each dog vary day by day, but this food often varies in degree of nourishment, palatability and assimilability. In individual brands, these factors may vary even from feeding to feeding.

It seems to us that the question of a better standard of nourishment for America's canine millions should concern dog-food manufacturers as seriously as it does veterinarians.

Here, at Gaines—in our plant, laboratories and research kennels—there is a continuous program of quality control, testing and improvement-research to maintain what we believe to be the highest standards possible in a modern dog food. The result is . . .

Homogenized Gaines Meal

A special Gaines process has combined ingredients of the Gaines formula into appetizing granules. These granules contain uniform amounts of every food element dogs are known to need . . . and are more assimilable, more palatable, far easier to feed! This uniformity is guaranteed in every package, every feeding, every *mouthful!*

Gaines Homogenized Meal is our answer to the need for a higher standard of dog nutrition. It is the answer of many veterinarians whose recommendations have helped make Gaines America's *largest-selling* dog meal.

We hope it is your answer, too!

Gaines
A Product of General Foods

HOMOGENIZED DOG MEAL
"Nourishes EVERY INCH of a Dog"

New Sixth Revised 1954 Edition of

THE PRACTICE OF

VETERINARY MEDICINE

One hundred sixteen illustrations,

811 pages, 6x9

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Professor of Veterinary Medicine and Superintendent of the Ambulatory Clinic, Emeritus

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NEW YORK STATE VETERINARY COLLEGE AT CORNELL UNIVERSITY

UDALL PUBLISHING COMPANY

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ITHACA, NEW YORK

POSTPAID PRICE $8.50

Bluetongue Vaccine

The Pitman-Moore Company, Indianapolis, has announced a vaccine, Bluvax, for preventing bluetongue in sheep. It is available in time to prevent the disease in already infected areas and to control its spread into other states this year.

Bluetongue, formerly confined to South Africa, is making severe inroads in this country, especially in the western and south western states. A virus disease, it is spread by a night-flying, blood-sucking insect. Greater activity is in August and September. According to the Company's researchers, sheep are protected within two weeks following vaccination with Bluvax.

Commercial Firms Grant Funds for Research

Three commercial grants totaling $3,000 for research was recently awarded the School of Veterinary Medicine, Kansas State College.

Commercial Solvents Corporation, Terre Haute, Ind., granted the school $1,500 to study bacitracin and penicillin in relation to growth and hematology of swine.

Norden Laboratories, Lincoln, Neb., granted the school $1,000 for an investigation of the milk fever syndrome in dairy cattle.

Charles Pfizer & Co., Inc., Terre Haute, Ind., renewed a grant for $500 for the study of the cause, prevention, and treatment of atrophic rhinitis in swine.

NEW IMPROVED RANCH RECORD VETERINARY SYRINGE

The Ranch Syringe was improved lately with a new two piece top cap. The plunger can be removed for sterilization without removing the glass barrel from the metal frame. This improvement makes it easier to sterilize and eliminates breakage. Smooth operation and accurate dosage is assured at all times.

The Ranch Syringe is made with finger bars or three rings.

Inquire at your nearest veterinary dealer or wholesaler about this new improved outstanding product.

Sizes 2cc. to 40cc.

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Swift's New Pard Meal

with flavor dogs can't resist!

Here, at last, is a tasty dry-type dog food! A dry meal that will satisfy your kennel feeding problems . . . your customers' home feeding problems . . . and every dog's appetite!

You can use and recommend Swift's PARD MEAL with the confidence that dogs will prefer it to any other meal-type food and will *stay* with it. Comparative feeding tests show a startling preference for this new product. Pard Meal has flavor DOGS CAN'T RESIST.

Pard Meal is packed with extra amounts of rich meat fat for super-energy and fuller nutrition. It's a complete diet—a dog needs nothing more.

New Pard Meal is homogenized—cleaner, quicker to feed, won't flake, powder or turn rancid. Available in 2 and 5-lb. cartons, 25 and 50-lb. bags. Try it now.

PARD is Swift's canned dog food. Here is the "pioneer" product of them all—for 21 years leading the way to today's high level of nutritional excellence in commercial dog foods. Dogs need nothing more—you can recommend nothing better than Pard.

NUTRITION IS OUR BUSINESS

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Well-established diversified mixed practice for sale in Ohio; 40-50% small animals and poultry, 60-50% large animals, dairy cattle, and swine. Includes small animal hospital recently constructed, 8-room home with 3-room apartment; home is old but well cared for. All on same lot. This practice has been well managed and cared for and is one you hope to have always; fine town and good clientele. Fine practice for a partnership. Average gross, $40,000 and increasing. Price, $34,000 takes all; must be able to put $15,000 down, balance monthly. Address "Box D 22," c/o JOURNAL of the AVMA.

Established mixed practice for sale in southern city of 75,000; terms can be arranged to suit buyer. Address "Box D 24," c/o JOURNAL of the AVMA.

Veterinary practice for lease on percentage basis leading to eventual ownership. A new practice, a good future; 75% small animals. Connecticut license required. Give full and complete details in first letter. Address "Box D 25," c/o JOURNAL of the AVMA.

Completely equipped small animal hospital with excellent practice for lease in Hollywood, Calif. Address "Box D 28," c/o JOURNAL of the AVMA.

Veterinary hospital, established twelve years, for rent by week, month, or year, or for lease from one to five years. Good location, parking space; lovely home on same premises as hospital. Real chance for right veterinarian. Address "Box D 29," c/o JOURNAL of the AVMA.

Well-equipped 30-cage hospital for sale on main highway in suburban Philadelphia. Valuable property includes two 4-room apartments; 4-car garage convertible to kennel building. Quick sale desired; other interests. $15,000 to handle. Address "Box D 30," c/o JOURNAL of the AVMA.

Mixed practice for sale; gross over $11,000. No real estate. $1,000 includes drugs and equipment. Address "Box D 31," c/o JOURNAL of the AVMA.

When a truck driver was sued in Kansas for injuring a horse and rider on a highway, the state's supreme court ruled in favor of the defendant since the rider's "vehicle" was not lighted front and rear.—*Farm J., Aug., 1954.*

JOURNAL OF PARASITOLOGY

Official organ of American Society of Parasitologists

A medium for the publication of papers on Animal Parasites (Protozoa, Helminthes, Arthropoda).

It also publishes the program and abstracts for the annual meeting of the American Society of Parasitologists in a Supplement.

Regular numbers appear in February, April, June, August, October and December.

Subscription price, $7.50 the year (Foreign, $7.75).

GEORGE R. LA RUE
CHAIRMAN, EDITORIAL COMMITTEE

JOURNAL OF PARASITOLOGY

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Miscellaneous

Kennel blanks, boarding records, boarding contracts, pedigree blanks, stud certificates—anything in records. Write us. *Dog World*, $3, year; $5, two years. Judy Publishing Co., 3323 S. Michigan Blvd., Chicago 16.

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Have your clipper blades sharpened by an expert with 28 years of practical factory training. We know how your blades must be ground to cut like new. Also clipper repairing. All work guaranteed to satisfy you or money back. Now serving veterinary colleges, and over 700 satisfied veterinarians. Why not you? 24-hour service. We ship insured prepaid. Avoid C.O.D. charges; enclose 75 cents for each set with blades. We are headquarters for Oster and Stewart clippers and blades. Complete clipping supplies; upper and lower replacements. Write for information on Oster and Stewart quality clippers and products. Service Grinding and Supply Co., 903 Chicago St., Racine, Wis.

Pregnancy Diagnosis—in mare from 45th to 150th day. Write for vials and mailing tubes. Price: $7.00; 2 or more tests, $6.00 each. Pregnancy Diagnostic Laboratories, H. S. Lames, D.V.M., Dysart, Iowa.

Received Too Late to Classify

Ambitious veterinarian from accredited veterinary college wanted; permanent, excellent future. Address "Box C 3," c/o JOURNAL of the AVMA.

Woman graduate, AVMA-approved school, 1953, desires position in small animal hospital in Middlewest. References. Address "Box D 33," c/o JOURNAL of the AVMA.

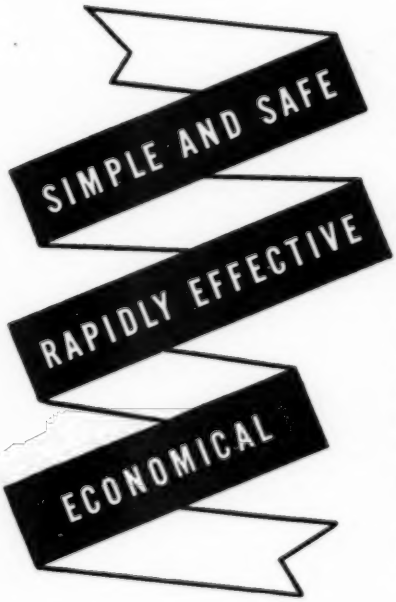
Ambitious veterinarian desires to buy, or lease with option to buy, small animal hospital on West Coast, preferably California. Three years of small animal experience. Address "Box D 34," c/o JOURNAL of the AVMA.

Mixed practice for sale on West coast; modern small animal hospital, good location in rapidly growing community, a fine clientele. Business grosses well over $30,000 per annum. Address "Box C 2," c/o JOURNAL of the AVMA.

in **Shipping Fever**
and related respiratory infections

PARENTRACIN

EFFECTIVE INTRAMUSCULAR THERAPY



PARENTRACIN (Bacitracin, Veterinary), a potent antibiotic restricted to use by the veterinary medical profession, presents distinct advantages in the treatment of shipping fever and related infections in cattle and sheep.

Parentracin is given intramuscularly—the difficulties of restraining the animal for intravenous injections is obviated. It is safe—in recommended dosage there is no damage to kidneys and other organs.

One injection usually suffices; within 12 to 24 hours the patients are feeding, and weight loss is rapidly recovered.

Dosage is low—10,000 to 20,000 units; since one injection suffices in most instances, Parentracin is in reasonable price range for all cattle and sheep, purebred or grade, feeder or dairy cow.

•

Parentracin is supplied in two sizes of rubber-stoppered vials containing 10,000 units and 60,000 units each.

It is available through all ethical veterinary distributors.

CSC® *Pharmaceuticals*

Veterinary Products Department • COMMERCIAL SOLVENTS CORPORATION

260 Madison Avenue • New York 16, New York

NEW HIGH POTENCY

Advantages

HIGH POTENCY

Greater adrenocortical stimulation with smaller doses.

HIGH PURITY

Low content of foreign solids and low content of proteins.

EASE OF ADMINISTRATION

Reduced likelihood of local sensitivity reactions on injection.

ECONOMY

Eliminates inconveniences and expense of frequent injections.

SQUIBB

TREATMENT FOR KETOSIS

PROLACTHYL* HP

veterinary

SQUIBB Corticotropin Gel (Highly Purified)

Most cases respond promptly to single injection

● Highly purified corticotropin (ACTH) in Prolacthyl HP Veterinary produces greater adrenocortical stimulation unit for unit than older forms of corticotropin – with rapid reversal of ketosis symptoms.

Most cases respond to a single dose of 5.0 cc. to 10 cc. (equivalent to 300 U.S.P. units to 600 U.S.P. units).

Blood sugar levels are usually raised to normal limits within 24 hours. Increased milk production may generally be expected within 3 days.

Supplied in vials of 10 cc. Each cc. provides 60 U.S.P. units of corticotropin. Order from your veterinary supply house.

For further information, write: SQUIBB, *Veterinary Department*, 745 Fifth Avenue, New York 22, N. Y.

Sold only to veterinarians

*PROLACTHYL is a trademark.

A NAME YOU CAN TRUST

in his hand

Wrap the big hand around the little hand . . . for now begins a little heart's journey into prayer . . . . the guide is Dad, the goal is a security not even he can provide.

But the pattern is security, and it is Dad's privilege to supply his part of it for the little hearts in his care.

In this binding, enclosing love life finds its finest answer.

The security of our homes is our worthiest goal. And providing it is a privilege unique in a country like ours, where each of us is free to choose his way.

And, think: The security that begins in *your* home, joined to that of other homes, builds the strength of America.

Saving for security is easy! Here's a savings system that really works—the Payroll Savings Plan for investing in United States Savings Bonds.

This is all you do. Go to your company's pay office, choose the amount you want to save — a couple of dollars a payday, or as much as you wish. That money will be set aside for you before you even draw your pay. And automatically invested in United States Series "E" Savings Bonds which are turned over to you.

If you can save only $3.75 a week on the Plan, in 9 years and 8 months you will have $2,137.30.

U.S. Series "E" Savings Bonds earn interest at an average of 3% per year, compounded semi-annually, when held to maturity! And they can go on earning interest for as long as 19 years and 8 months if you wish, giving you back 80% more than you put in!

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Index to Advertisers in This Issue

Abbott Laboratories 14
Affiliated Laboratories Corporation 18
Allied Mills, Inc. 10
Armour Veterinary Laboratories .. 11, 23
Ashe Lockhart, Inc. ..... 3rd cover
Associated Serum Producers, Inc. .. 40, 41
Astra Pharmaceutical Products, Inc. ... 6
AVMA Report 8
Baltimore Wire and Iron Works 24
Boston Instrument Mfg. Co., Inc. 46
Burdizzo 34
Burlington Instrument Co. 5
Chatham Pharmaceuticals, Inc. 12
Classified Advertisements 36
Clipper Service 44
Coming Meetings 22
Commercial Solvents Corporation 49
Corn States Laboratories, Inc. .. 2nd cover
Correspondence 42
Curts Laboratories 36
Ford Fence 30
Fort Dodge Laboratories, Inc. 7, 20
Fromm Laboratories, Inc. 13
Gaines Dog Food 45
Haver-Glover Laboratories 54
Hill Packing Company 32
Instructions to Authors 53
International Minerals & Chemical Corporation 38
Jensen-Salsbery Laboratories, Inc. ..... 4th cover
Journal of Parasitology 48
Kasco Mills, Inc. 29
Ken-L Products 25
King Research, Inc. 43
Liability Insurance 26
Lowe's, Inc. 38
MacAllan Laboratories 38
Martin Laboratories 34
S. E. Massengill 27
Miles Laboratories, Inc. 31
National Laboratories Corporation ... 39
Nicholson Manufacturing, Inc. 44
Norden Laboratories 1
Nutritional Research Associates 22
Osco Chemical Company, Inc. 32
Parke, Davis & Company 21
Pfizer Laboratories 16, 17
Pitman-Moore Company 1
Professional Printing Company, Inc. .. 28
Ralston Purina Company 9
Rockland Farms 30
Sharp & Dohme 33
Ivan Sorvall, Inc. 42
Squibb 50, 51
Swift and Company 47
Udall Publishing Company 46
U.S. Savings Bonds 52
Upjohn Company 15
Vitamineral Products Company 19
Western Condensing Company 37
White, Dr. George Ransom 22
Winthrop Stearns, Inc. 35

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Exclusive Publication.—Articles submitted for publication are accepted with the understanding that they are not submitted to other journals, which is ethical publication procedure.

Manuscripts.—Manuscripts, including **footnotes, references,** and **tables,** must be typewritten, **double-spaced,** on 8½- by 11-in. bond paper, and the **original,** not the carbon copy, submitted. One-inch margins should be allowed on the sides, with 2 in. at top and bottom. Articles should be concise and to the point. Short, simple sentences are clearer and more forceful than long, complex ones.

Illustrations.—Photographs should be furnished in glossy prints, and of a size that will fit into the JOURNAL of the American Veterinary Medical Association with a minimum of reduction. Photomicrographs which can not be reduced should be marked for cropping to 1-column or 2-column width. Identifying marks within the photomicrographs, such as arrows, letters, or numbers, should be clearly marked with black India ink or white opaque ink to insure good reproduction and must be large enough to stand reduction, if necessary. Drawings, graphs, and charts should be made clearly and accurately in India ink on white paper and a glossy print of them submitted when possible. Numbers or letters appearing on graphs or charts should be large enough to allow for any reduction necessary for the chart or graph to fit JOURNAL pages. Blue lines in graph paper drop out in reproduction; therefore, if lines are required they must be drawn in black ink. All illustrations should bear the name of the author and the illustration number on the back.

Tables.—Tables should be simple and typed **double space.** Complex tables are not conducive to perusal. It is wiser to summarize complex material than to tabulate it.

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Why Phosphorus is important in

C.G.P. Reinforced

. . . is explained by recent research which identifies PHOSPHORUS as the activating influence upon the parathyroids of the bovine, thus governing the CALCIUM content of the blood.

It contains **therapeutic amounts** of **phosphorus, calcium, magnesium,** and **dextrose** in balanced proportions . . . sufficient to overcome any of these deficincies, thus **speedily** restoring and **keeping up** normal blood levels.

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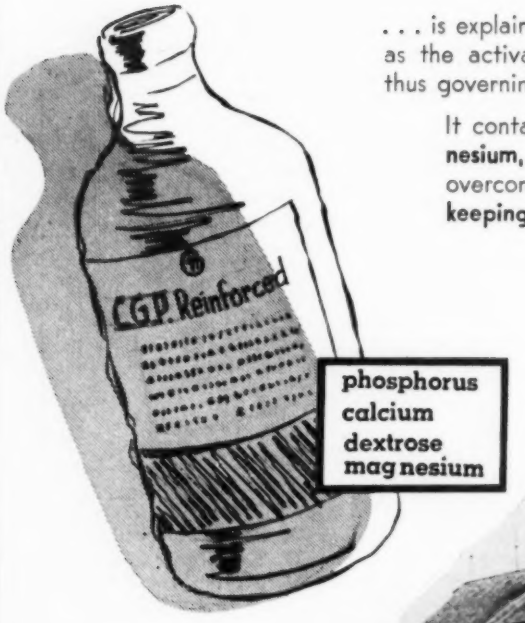
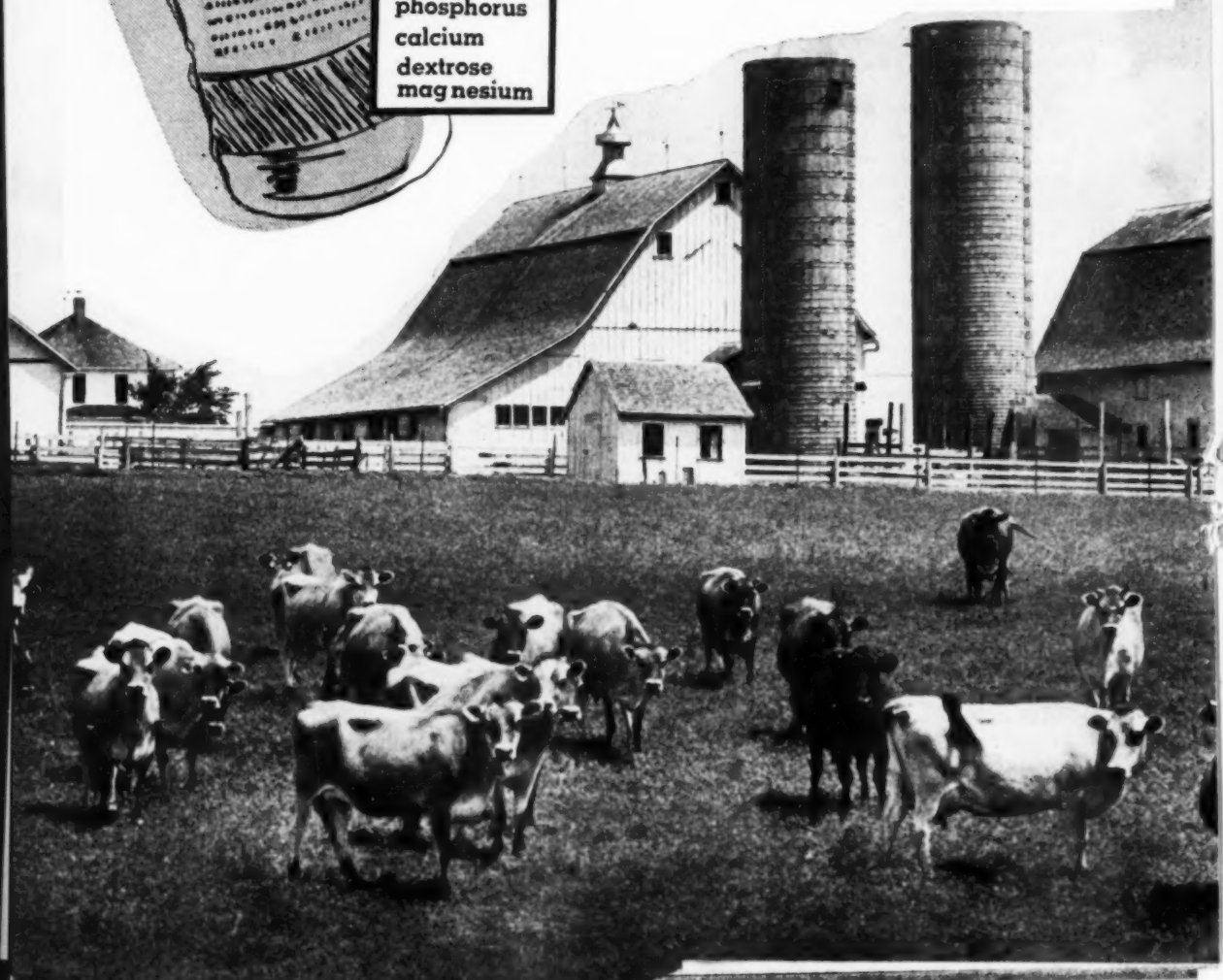
Kansas City, Missouri





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Desiccated

Modified Live Virus Chick Embryo Origin

Now — with the addition of *Modified Live Virus Canine Distemper Vaccine, Chick Embryo Origin, Desiccated,* to our line of killed vaccines — a complete armour against canine distemper and infectious hepatitis.

A *single injection* vaccine which will develop a solid, long-lasting immunity — economical both in time and cost.

The ideal age for immunization is approximately 4 months, but many puppies have been successfully immunized at 2 months or younger.

Modified Live Virus Canine Distemper Vaccine (Lockhart)* can be given simultaneously with Infectious Canine Hepatitis Vaccine. In cases of possible exposure to either of these dreaded diseases of dogs, a prophylactic dose of Anti-Canine Distemper Serum and Anti-Infectious Canine Hepatitis Serum may be given which will produce an immediate passive immunity against both diseases, and which will not interfere with the active immunity produced by the two vaccines. Thus the *factor of safety.

This *new* product is attractively and professionally packed in single- and five-dose packages — designed for the discriminating veterinarian — and produced by veterinarians for veterinarians.

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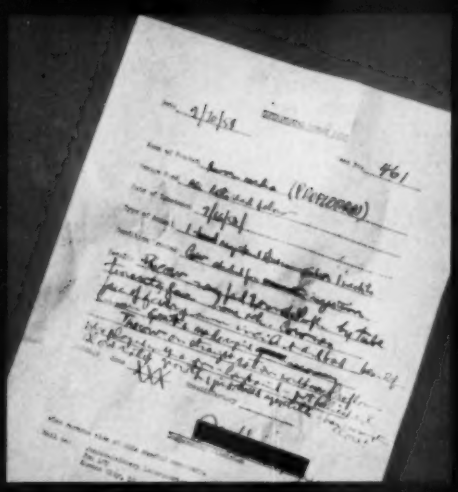
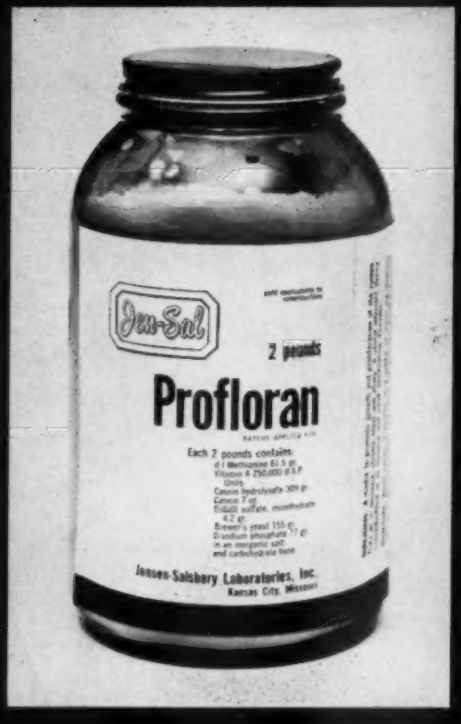


case report 461 | toxic indigestion
(ingestion of placenta)

A practitioner in Southern Ohio sends us this case report involving use of PROFLORAN in treatment of toxic indigestion in a valuable dairy cow. On arrival at client's farm, he was told that the patient had calved recently, and had eaten the placenta. The animal's temperature was now 107°. She had not eaten for several days and her condition was generally quite toxic.

Immediately, the practitioner administered rumen stimulants plus two pounds of PROFLORAN rumen media in water by stomach tube. Within 24 hours, cow ate and drank normally and soon recovered completely. This practitioner has since used PROFLORAN in similar cases with comparable results.



why PROFLORAN therapy is successful when rumen transplants fail

PROFLORAN therapy has been strikingly *successful where rumen transplants have failed.* WHY?

The answer is simple: when rumen function is impaired, conditions within the rumen are unfavorable for growth and reproduction of the normal microflora. Unless something has been done to improve the environment within the rumen, transplants of either fresh or preserved organisms will fail (or be only partially effective).

Now PROFLORAN, a highly concentrated microfloral food, provides two things: *alkaline salts* to serve as a buffer and substitute for the lack of salivary flow; and a *nutrient media* in which normal gram-negative organisms can develop and grow.

Introduced into the rumen by stomach tube, PROFLORAN *reduces the acidity* of the fermenting contents, making possible the regeneration of normal bacteria *without transplants* . . . and *provides essential nutrients* for increased bacterial growth and reproduction.

Hundreds of practitioners have now substantiated the PROFLORAN principle.

PROFLORAN is supplied in 2 pound jars, boxes of six. One jar, mixed with water and given by stomach tube or on feed, has proved effective in most cases. Try PROFLORAN soon.

Jensen-Salsbery Laboratories, Inc.

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